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Constraints on Wh-long distance movement in adult Chinese for L2 acquisition and the implication for L2 teaching.

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CONSTRAINTS ON WH-LONG DISTANCE MOVEMENT IN ADULT CHINESE FOR L2 ACQUISITION AND THE IMPLICATION FOR L2 TEACHING

A Dissertation Presented

by

LI, XIAOLI

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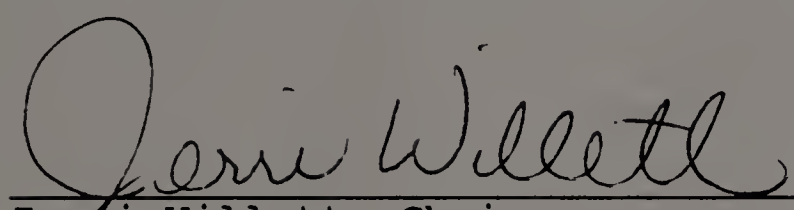
Approved as to style and content by:



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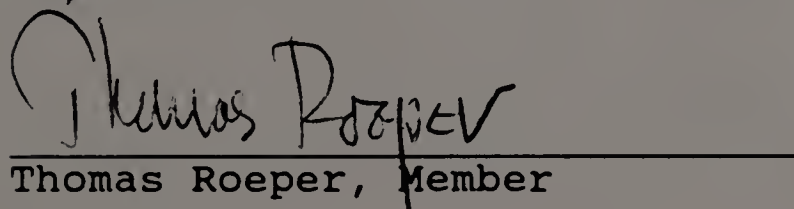

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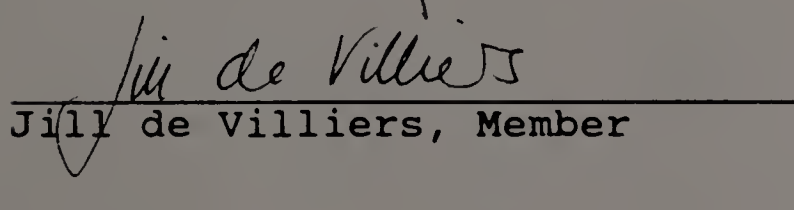

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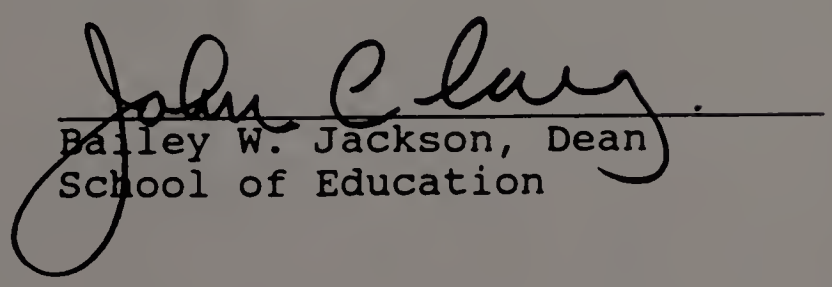

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ABSTRACT

CONSTRAINTS ON WH-LONG DISTANCE MOVEMENT

IN ADULT CHINESE FOR L2 ACQUISITION

AND THE IMPLICATION FOR L2 TEACHING

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Previous studies on the sensitivity of Subjacency by adult L2 learners whose native language does not observe the rule have drawn different conclusions concerning adult sensitivity to Universal Grammar (UG) principles. This study further explore this issue by investigating not only Subjacency but also the Empty Category Principle (ECP).

Using Chinese L2 learners of English, the present study tests their limitations on extraction out of several island conditions and their sensitivity to Wh-arguments (what, who, which) and Wh-adjuncts (when, where, how and why). Participants in the study included 180 Chinese freshmen and sophomores in a Chinese university, who were non-English majors and had never been exposed to an English speaking country and 16 Chinese L2 learners who were studying at

University of Massachusetts at the time of study and who had at least 3 years of intensive English training before and had continually employed English afterwards. 25 English-speakers also participated in the study as a control group.

They were asked to perform a grammaticality judgment task and a reading comprehension task on Subjacency and the ECP. The proficiency of the first group was measured with CELT and Assessment of Syntactic Capabilities tests.

The study has found Chinese L2 learners demonstrated limitations on extraction from island conditions. Once they had sophistication in English, their performance score on Subjacency tasks showed no difference from that of the native English-speaking group. The informants also treated the different island conditions differently. They also distinguished Subjacency violations in relative clauses from that in noun complement clauses.

In the reading comprehension task, the 180 Chinese informants had the similar patterns to the control group and the children in DeVilliers' study. They allowed Wh-LD movement when the COMP in the embedded clause was not filled in English; when the COMP in medial was filled, they (like children and native speakers), gave answers to the lower clause when the trace was properly governed; they distinguished argument questions from adjunct questions by giving more answers to the former than the later questions.

The study considers the implications of the above results for L2 teaching.

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GLOSSARY:

: A sentence with a "" indicates that this sentence is not grammatical or unacceptable in this paper.

1. A-not-A: A linguistic structure in Chinese,
   eg. ni kan bu kan zhebenshu?
   you read not read this book

2. arguments & adjuncts: arguments here refer to "what," "which," "who," and adjunct refers to "why," "how," "Where," and "when."

3. base-generated: When positions of constituents exist in the deep structure, they are base generated instead of through movement.

4. cleft sentence: A sentence which has been divided into two parts, each with its own verb, to emphasize a particular piece of information.
   eg: It was Mary that Mrs Smith gave the dress.
   (Longman Dictionary of Applied Linguistics,1985)

5. CNPC: Complex Noun Phrase Condition
   No rule can move any element out of a Complex Noun Phrase Clause.
   * What did you like the man who bought - ? (ibid)

6. Complementiser: particles such as THAT, FOR or WHETHER - used to introduce complement clauses are known as Complementisers (see sentences a, b and c). They are generally abbreviated as COMP, or (in more recent work) simply C.

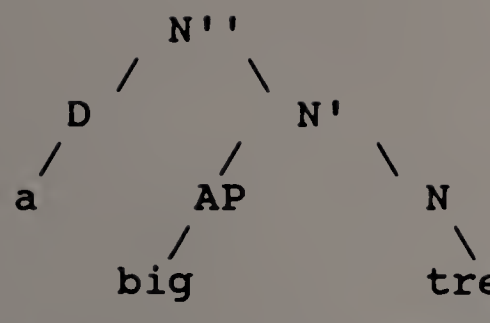
   a. We know for certain THAT the President will approve the project.
   b. We would obviously all prefer FOR the matter to be resolved amicably.
   c. I couldn't really say WHETHER it will rain.
   (from Radford, 1988, p.292)

7. ECP: Empty Category Principle which states that a trace must be properly governed. See Chapter 2.

8. g-marked: a mechanism in government

9. Heads: V is a head of a verb phrase and N is a head of a noun phrase.

e.g.



(the head is "tree")

10. iff: reads "if and only if" often used in linguistic definitions.

11. infls: inflections of verbs including tense

12. Language Aquisition Device (LAD): the capacity to acquire one's first language, when this capacity is pictured as a sort of mechanism or apparatus (from Longman Dictionary of Applied Linguistics).

13. LF: logical form is a hypothesized level of linguistic representation which is related to S-structure in a certain way and represents some aspects of meaning (Riemsdijk & Williams, p.80).

14. NP-island condition:
No element can be moved out of a noun phrase.
* What do you like that dress with - ?

15. pied-piping: When a proposition is moved together with a wh-word, this scheme is called pied-piping.

With whom did you go to see the movie - ?

16. SPEC: a position for a specifier
A specifier is an item that preceeds a Head. In "a student", "a" is a specifier for the Head -- "student" in this noun phrase.

17. SSC: Sentential Subject Condition
No constituent can be moved out of a sentential subject.
* What would for you to give up - be a pity?

18. Subjacency: a restraint on movement; for details, see Chapter 2.

19. Superority effects and That-t-effects : phenomena that violate ECP which is defined as [e] (the empty catergory) should be properly governed.
e.g. Superority effects:
* I do not know what who did [e].

That- t - effects:

* Who does John believe that [e] saw him?

20. TOP: a position for a topic
In languages like Chinese, a top proceeds the subject of a sentence.

e.g. Zhebenshu, women du xihuan kan.
this book, we all like read

21. t: a trace where a wh-word move from, sometimes "-" is used to refer the same. eg: What did you eat t ?
What did you eat - ?

22. target language: also L2, (in language teaching) the language which a person is learning, in contrast to a FIRST LANGUAGE or mother tongue (ibid).

23. Wh-in situ: In languages like Chinese, Wh-phrases are placed in the same position as their non-wh counterparts would occupy in Wh-questions.
e.g. ni xihan shime?
you like what

24. Wh-island condition:
No constituent can be adjoined to a COMP which already contains a wh-constituent (Radford,1981).

* How did the man learn what to teach - ?

25. Wh-movement: the movement of corresponding Wh-words such as WHAT, WHO, WHEN, HOW, WHY and WHERE from the gap.

CHAPTER 1

INTRODUCTION

With the rapid development of linguistic theory in recent years, many second language (L2) acquisition researchers (Flynn,1987; White,1988; Schachter,1988) have been looking at L2 acquisition using the Universal Grammar (UG) framework, and bringing L2 acquisition research to a new stage. Many controversial issues in L2 acquisition have been investigated again using the UG framework, and new proposals and claims have been made in exploring the L2 learning process and explaining L2 acquisition development. Researchers have found that adult L2 learners are sensitive to a hypothesized universal principle in some studies and they have also found different results among L2 learners whose first languages (L1) were different. These results have reopened a discussion on such issues in L2 acquisition as the accessibility to UG principles by adult L2 learners and language acquisition sequence.

One UG principle that has been most widely investigated is Subjacency, which shows limitations of extraction in Wh-questions in L2 acquisition. A sentence consists of a number of constituents. Some of them stand out as tight units ("islands") and nothing can be extracted out from them. The relative clause is such an example. When an element is

extracted out from a relative clause, you will get a bad sentence.

* 1. What do you remember the person who bought -- ?

This limitation is not only found in English but in several other languages as well. It is assumed to be universal. However, linguists have also noticed that some languages like Chinese, Japanese and Korean do not move Wh-words or phrases to the beginning of Wh-questions; instead, the Wh-words or phrases are in the same place that their non-Wh counterparts would occupy, so extraction is not involved and these languages do not observe the same limitations on extractions as other languages.

The question that interests researchers is whether adult L2 learners whose native languages do not show the limitation of extraction are sensitive to the limitation in the target language. In light of UG, all UG principles are available to all languages even though they might not occur in these languages. Therefore, these L2 learners of English should be sensitive to Subjacency in English.

Due to biological development, according to one theory, learning may become more difficult after puberty because the brain lacks the ability for adaptation (Lenneberg 1967).[1] In light of this theory, if L2 learners are not exposed to a UG principle such as Subjacency before puberty, they will not have this UG principle. Do adult L2

learners have the UG principle in the target language when it does not occur in their native language?

There exist three different views on UG accessibility to L2 learners: first, UG rules are accessible to adult L2 learners even though they do not apply in their L1 (Richard, 1978); second, UG is only partially available to adult L2 learners (Bley-Vroman et al., 1988); third, UG has shut down to adult L2 learners if they do not realize the rule in their L1 (Schachter,1988). The question of whether a UG principle is accessible to L2 learners when their L1 does not observe it, is far from answered.

Another assumed UG principle that has not really been investigated in L2 acquisition is the Empty Category Principle (ECP) which states that a trace or a gap must be properly governed. The ECP not only concerns the limitation of extraction but also concerns the type of Wh-word that is extracted in Wh-questions. This principle distinguishes WHO, WHAT or WHICH that questions the argument (e.g. the object of a verb) from WHEN, WHERE, HOW or WHY that can only question an adverbial part of a sentence. The former Wh-words have a closer relationship with their verbs while the later ones do not. WHO, WHAT and WHICH, Wh-arguments, replace their non-wh counterparts that serve as objects of their verbs. These verbs subcategorize for a noun phrase. Therefore, when the noun phrase (or the object) is extracted out, it is easy to link the Wh-word with the verb in the

embedded sentences. This is not the case for WHEN, WHERE HOW and WHY, WH-adjuncts, for their non-wh counterparts function as a verb or sentence modifiers.

For instance, there is a difference between the Wh-argument in sentence 2 and the Wh-adjunct in sentence 3.

2. What did he know that Peter bought -- ?

3. How did he know that Peter bought a car -- ?

WHAT in sentence 2 has a much closer relationship to the verb BOUGHT than HOW in sentence 3 to the verb BOUGHT. Without the Wh-words, sentence 2 is not acceptable while sentence 3 is still grammatical.

* 4. Did he find that Peter bought?

5. Did he find that Peter bought a car?

Sentence 4 is not acceptable because an object for BOUGHT is missing and the verb BOUGHT is subcategorized for a noun phrase as an object. It is obligatory. In contrast, sentence 5 is good because HOW in sentence 3 is an adverbial and it is optional for the main sentence and the embedded clause. For this reason, it is easier to associate the gap with WHAT in sentence 2 than the gap with HOW in sentence 3.

The ECP, though it has not been explored in L2 research, has been studied in child language acquisition. DeVilliers and Roeper (1988,1990,1991) have done an extensive study on children's acquisition of Wh-movement. They have found that preschool children permit extraction

out of embedded clauses when there is no Wh-word in medial.[2] Take sentence 6 for example.

6. How did the policeman say -- the man had stolen the purse -- ?

Based on a story, 44% of the children respond "with a pair of long tweezers" which link HOW with the embedded clause. This means that children allow Wh-words to move to the initial position of a sentence from the embedded clause or they allow cyclicity[3] in Wh-movement.

DeVilliers and Roeper's study also demonstrates that English speaking children as young as 3 years old start to show a difference between Wh-arguments and Wh-adjuncts. They give more answers to Wh-arguments than Wh-adjuncts. Furthermore, children in their study are very sensitive to the gaps that are not governed in Wh-island condition sentences such as in "How did the girl ask -- who to paint *--?" In other words, they respect the ECP. Research in child language acquisition in this area has stimulated researchers to look at adult L2 acquisition in this area.

For adult L2 learners whose L1 does not move Wh-words to the initial position of a sentence, it is not clear whether they allow the Wh-question word to move from the embedded clause to the sentence initial position in the target language. It is not clear whether they distinguish Wh-arguments from Wh-adjuncts and whether they obey the ECP.

The current study will test the sensitivity of limitations of extraction in English on adult Chinese speakers of English since extraction is not involved in Wh-questions in Chinese. This study will also test whether Chinese informants treat the two types of Wh-words in questions differently.

These issues are important for several reasons: first, L2 acquisition may serve as a testing field for linguistic theories. If L2 learners do not have knowledge of a UG principle, we have to find out whether certain criteria have to be satisfied so that they can realize the principle or if the theory needs modification. Furthermore, it is not clear whether under the Subjacency principle, an island condition such as Complex Noun Phrase Conditions (CNPC) shown in sentence 1, is as constraining as Noun Phrase Conditions shown in 7.

* 7. Which movie have you forgotten the famous director of -- ?

Both sentences 1 and 7 violate Subjacency. Will L2 learners treat them differently? What are the possible factors that cause the difference?

Second, viewed from the UG framework, second language acquisition research may offer more insights into the way L2 interacts with learners' L1 and how L2 is processed. The major difference between L1 and L2 learning lies in their starting point. L2 learners already have the knowledge of

their native languages when they start learning a L2. In terms of grammar, children acquire their mother tongue without learning grammar rules while L2 learners typically learn the grammar rules of the target language. However, they do not have to learn all the rules because some rules in their L1 are also shared by the target language. Then what role does learners' L1 play in L2 learning?

Third, the results will also throw light on controversial issues in L2 research, one of which is, the degree to which the language acquisition device (LAD) is operating in adult L2 learners. For a long time, L2 researchers have debated whether UG is still accessible to adult L2 learners. This issue is in certain ways related to the issue of the "critical period hypothesis", which states that the ability to acquire a language decreases after puberty because cortical lateralization has already taken place (Lenneberg, 1967). Researchers reexamined this hypothesis from the framework of Universal Grammar by testing L2 learners' sensitivity to certain abstract rules. Several studies on L2 learners with different language backgrounds have been conducted to test their sensitivity of limitation of extraction, but the results have varied. The current study will look at the same issue by examining different types of sentence structures and using a much larger sample size of informants with homogeneous backgrounds. The current study will also test an additional

universal rule, ECP, to see whether adult L2 learners distinguish different types of Wh-words in questions. This may provide another piece of evidence addressing whether UG is still accessible to adult L2 learners.

Another debated issue is whether children's L1 and the adult L2 acquisition follows the same pattern. This again is an old issue revisited from a new perspective. In the 60's and 70's, several studies compared the L2 learner acquisition sequence with the children's L1 acquisition sequence. Similar orders were found indicating that adult learners were following almost the same order as children in their language development. These experiments focused on such surface linguistic features (of English primarily) as negation, yes-no question formation, etc. The discovery of abstract principles in recent linguistic theory and child language acquisition is important to L2 researchers and teachers for understanding the L2 learning process. But these abstract principles can also be instructive. For example, if these principles appear in L2 adult learners' development in the same order as that of the child learners, we might hypothesize that an effective way to learn a language is to follow the sequence. There may be some features that govern this sequence and violation of it may lead to slowing down of the learning process.

Finally, exploration of the above issues as well as the results of L2 research using this framework will provide

implications for L2 teaching and learning. If teachers have a better understanding of the nature of a language and the difference between learners' L1 and L2 languages, they will better understand what adult L2 learners already know and why they use the target language in certain ways. Teachers can help them utilize fully their linguistic knowledge in learning a L2. In other words, teachers will better understand the learner's interlanguage and adjust their instructions accordingly. If L2 learners have the same target language development sequence as children, this may suggest that there is a natural acquisition order and, by following it, learning and teaching may be more effective, particularly in foreign language teaching or in learning the target language rules as a conscious system.

The current study consists of a judgment task and a comprehension task involving Wh-question extraction from both the matrix and subordinate clauses. Three groups of informants participated in this study. The first group included 180 Chinese college students (Chinese Group 1) who were studying English as a foreign language in a university in China at the time of the study. The second group consists of 16 Chinese graduate students and visiting scholars studying in the United States (Chinese Group 2). The second group has more advanced English knowledge so their participation in the study helps further demonstrate the relationship between their English proficiency and their

sensitivity to UG principles. The third group is made of 25 English native speakers, serving as a control group.

Chinese speakers have been chosen because Subjacency does not apply in Wh-questions in Chinese. On the other hand, since the ECP is assumed to be applied both at syntactic level and Logical Form level, Chinese is supposed to observe the ECP. If the informants show their sensitivity to Subjacency in the tasks, then we can say that UG is still operating because there is no other way that the informant can select the right choice. If the informants fail to show their sensitivity to these principles, we should find out the reasons. With a large sample of learners with different English proficiency levels, it may be possible to study informants' performance on the tasks in a cross-sectional way to see whether language proficiency level correlates with their performance on the tasks and whether there is a sequence through which these abstract principles are realized.

This paper is divided into seven chapters. This chapter has briefly described the study and its importance. Chapter 2 focuses on the linguistic background to which this study is related. It compares linguistic facts of Wh-movement in Chinese with English linguistic facts. This chapter will also discuss acquisition data from Chinese L2 learners of English to show the effects of Chinese on their English learning.

Chapter 3 offers a brief review of recent L2 research in the UG framework, mainly the studies dealing with adult L2 learners' accessibility to UG principles. Chapter 4 introduces the methodology this study adopts, including information about informants, procedures, and materials. Chapter 5 contains the results of the experiments and a discussion of them. A general discussion is given and tentative conclusions are reached in Chapter 6, responding to questions raised in the previous chapters. Chapter 7 discusses the implications of L2 research in the UG framework for L2 teaching and learning.

CHAPTER 2

LINGUISTIC BACKGROUND AND ACQUISITION OF WH-MOVEMENT BY CHINESE LEARNERS OF ENGLISH

No matter how one language differs from any other language, it is not difficult to find the common features shared by all languages. These features suggest that human beings may be born with a certain mechanism that enables them to learn any human language. Current linguistic theory and research in the UG framework has been trying to capture these features and at the same time acknowledge the differences among languages. L2 language researchers and language teachers are more interested in learning what the universal principles are and what effect the difference between two languages will have on L2 language learning by speakers of these languages. The two languages concerned in this study are Chinese and English. Like other languages, these two languages are structure dependent; their structures can be recursive; sentence configurations are hierarchical instead of linear; these two languages share the same word order--subject, verb, object (SVO).

However, Chinese is in many ways different from English. This study focuses on Wh-Long Distance (Wh-LD) movement so Wh-structures of these two languages will be

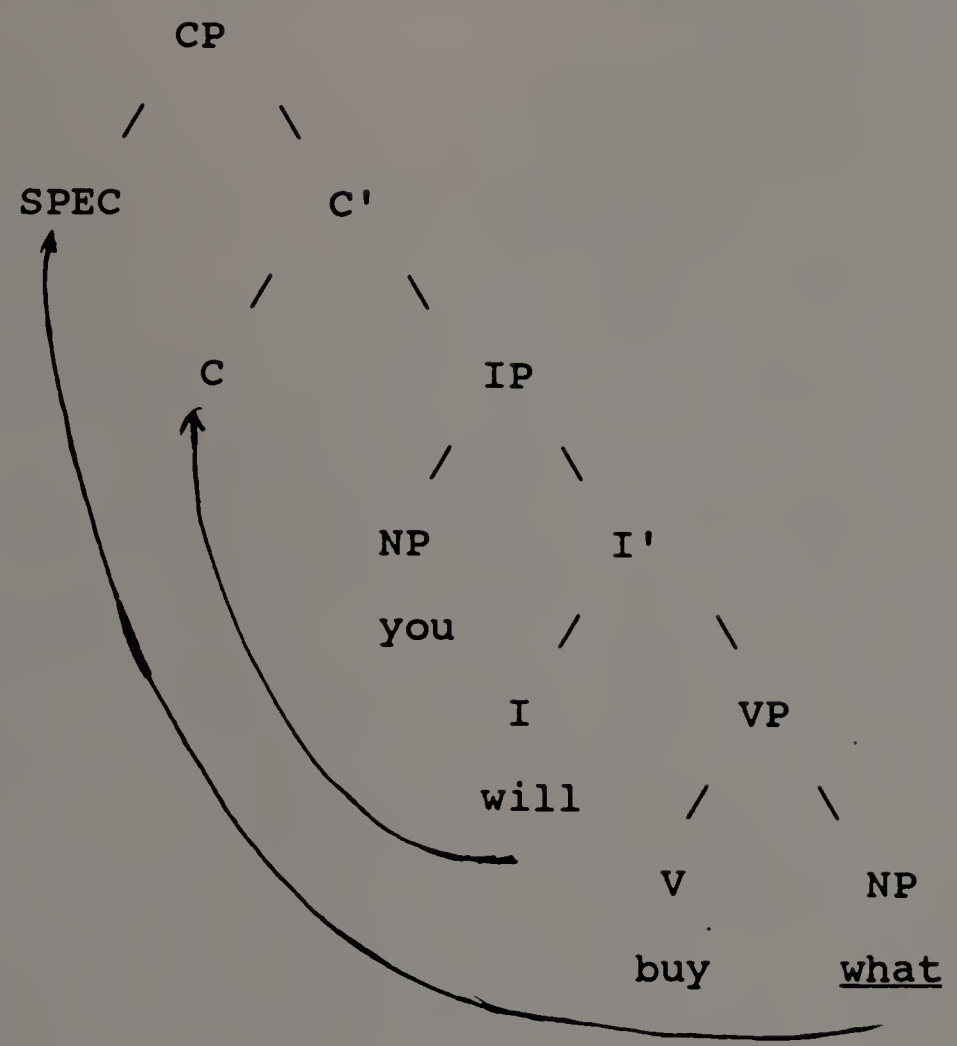
compared to see how these differences affect adult Chinese speakers learning English.

2.1 Wh-questions

To form a Wh-question in English, the Wh-word should go to the sentence initial position and subject and axiliary should be inverted. Example 1 follows.

1. What will you buy ?

The deep structure of [1] looks like this:



To form a Wh-question in English, "what" has to move to the SPEC position and "will" has to go to the "C" position, thus obtaining 1. But in Chinese, neither Wh-word movement nor subject and auxiliary inversion is involved. Based on empirical evidence that Wh-movement involves movement of a Wh-phrase to a clause-initial Complementizer, Radford (1988) assumes that only languages which have clause-initial Complementizers will have Wh-movement. Bresnan (1970:317) also claims that this is so. Languages like Chinese do not have clause-initial Complementizers so Wh-movement is not involved and Wh-phrases stay in-situ. See below.

2. ni xihuan shei?
   you like who
   "Who do you like?"

In Wh-question formation, Chinese is very different from English and it was hypothesized that Chinese learners of English would have difficulty in learning Wh-questions in English. However, acquisition data does not support this assumption. In her longitudinal study, Hoekje (1988) found that although movement is not involved in Wh-questions in Chinese, movement does not seem a problem for even beginning learners. The first sample collected from low-proficiency learners show that initial Wh-words are used in 179 out of 187 Wh-questions. Wh-words are in situ in only eight cases. However, the eight cases such as sentence 3 and sentence fragments such as 4 still suggest that the first stage is non-movement but that learners get over this stage very quickly.

3. "Today I make uh how much for pay?" (p.118)
4. "How much, this jacket?" (p.117)

Sentence 3 clearly indicates L1 transfer in English learning where the Wh-phrase is in-situ. Although the Wh-word in 4 is in sentence initial position, it is not a sentence. The Wh-word seems base-generated because the Wh-

word is intonationally separated from other sentence fragments (p.118).

Of all the Wh-questions Hoekje collected, those with the Wh-word in initial positions account for over 95% of the sentences, but the auxiliary inversion rate was relatively low in applicable cases. The rate for one learner is only 27% (7/26) and 50% (10/20) for another learner in their first sample. Though the inversion rate is low, Hoekje has also found other evidence to argue for the movement analysis: intonation is incorporated into Wh-questions and no resumptive pronouns appear in the gap. She concluded that adult Chinese learners charge from non-movement in Wh-question formation to movement and it does not take long for adult learners to develop to the movement stage.

2.2 Complementizer

Why doesn't Wh-movement present a problem for these Chinese learners as predicted? Why is the inversion rate so low?

Although a Wh-word is in situ in Chinese questions, Chinese has a position higher than S although it is not ordinarily a position for Wh-phrases. It is usually occupied by a topic because it is a discourse-oriented language. Chinese learners fill this position with a Wh-word just as they fill it with topics soon after they pass the short no-

movement stage. The no-movement stage is short for Chinese learners of English because Wh-movement operates at logic form (LF) level in Chinese.

In line with linguistic typology, Huang (1982b) thinks that all languages including Chinese have a Wh-movement rule but they may differ at which level they use the rule, in syntax or in LF. "A consequence of this conception of linguistic typology is that it allows a simple statement of the fact that all languages have the same semantics of questions, though they may each have a different syntax of such sentences (p.254)." Sentence 2 repeated here in 5 and 6 have identical LF representations.

5. Ni xihuan shi?
you like who

6. Who do you like?

Chomsky (1986) shares with this view and holds that in languages like Japanese and Chinese, the Wh-phrase is moved to the boundary of the clause, leaving an empty category as a variable, although this operation does not take place overtly as in English but at LF. Wh-movement exists in both English and Chinese but differs at the level in which it occurs. When Chinese learn English Wh-questions, they will

modify the parameter they set for their L1 and operate Wh-movement rule at the syntactic level.

As for the COMP position, Xu (1985) holds that Chinese has no lexical complementizers without semantic content (like the English THAT) which serve as clause introducers. He then proposes the following rule:

S' --- TOP S

TOP is a topic structure identified as a grammatical function of a constituent not as a category. It is not clear whether functional categories exist or not but their heads are empty in Chinese.

Xu's analysis does not conflict with Radford's C-specifier analysis (1988) according to which the specifier phrase is optional in a CP constituent and it is assumed to be a base-generated empty XP constituent into which an appropriate Wh-phrase can be preposed by Wh-movement (p.504). There is no reason why a TOP can not be in the SPEC position.

Wh-movement and subject and AUX inversion (also called I-movement) are two separate movement rules, both involving the COMP position. The COMP position is the head of a C-bar constituent and a landing site for AUX, lack of which will cause problems in inversion. Since SPEC position is assumed to be base-generated and topic structures are also base-generated (XU, 1986), it seems that SPEC position is occupied by TOP. In languages like Chinese, Wh-movement does

not occur at syntactical level and Wh-phrases do not need to move to the SPEC position. So it presents no problem. Whether Wh-movement at LF requires SPEC position is not clear.

The inversion of subject and AUX is leftward, that is, AUX moves to the COMP position as [1] illustrates. Since there is no COMP before the subject position and no inversion is involved in Chinese questions, they have to set up a COMP position for AUX to land on. As for AUX, it occupies the I position, which does not overtly exist in Chinese. It takes time for learners to establish a COMP and I for the AUX.

2.3 Free Relatives and Relative Clauses

Since this paper is mainly concerned with Wh-LD movement in English by Chinese speakers, we need to see how Chinese speakers acquire English complex sentences. Here we mainly look at relative clauses. A comparison of the two languages on this sentence type will help to have a better understanding of the interlanguage of adult Chinese learners of English.

2.3.1 Free Relatives

Unlike English which obligatorily requires Wh-words, Wh-words or phrases do not appear in Chinese free relatives. Compare sentence 7 in English with the same sentence 8 in Chinese:

7. I have read what he has written.
8. Wo kan le ta xie de.
   I read he write

When adult Chinese speakers learn English, they are already proficient in their first language. For the beginners, we expect them to use free relatives without Wh-words. The acquisition data from Hoekje (1988) support this assumption. Sentences 9 and 10 are samples of this kind.

9. "Because president want, see, a people life is: is poor or rich, is happy, is not happy."
   (Because the president wanted to see [how/what] people's life was: if it was poor, or was rich, happy, or not happy)

10. "If I see you r-uh, really uh, really is..."
    (If I see (what/how) you really are) (p.131.)

The data also show that the increase of Wh-word use goes with the improvement of English proficiency in free relatives. Wh-words appear later. Look at sentence 11:

11. "But I fighting each other, who is short, who is better."

(If we are fighting each other, whoever is short is better) (p.132)

2.3.2 Relative Clauses

For the native speakers of English, Hoekje found that Wh-words are seldom used in relative clauses (RC). Therefore, she concludes non-use of Wh-words does not mean that movement is not involved in these Chinese learners of English. Nevertheless, she thinks that most of the RC's by these learners do not have movement for the following reasons:

Retention of resumptives in the gap:

12. So I showed them a sweater <u>that my aunt got IT from another group in China</u> (p.173)

No Wh-word even when it is in a subject position:

13. The guy [e] got the phone before was Bob Joe.(p.172)

14. I have other teacher [e] teach me drawing.(p.133)

No relation with head NP:

15. This is the number <u>that he can go downstairs</u>.

Preposition chopping:

16. The guy I told you ....

Although most of the RCs do not involve Wh-movement, Hoekje (1988) did find that Wh-movement appeared in the first sample of one of her three adult learners, a higher proficiency speaker. In her second sample, the percentage of her Wh-word use has increased from 15% to 50% and these Wh-words constitute a range of forms rather than a single Wh-word.(p.177) She therefore concludes that Wh-movement in relative clauses is a late-learned rule applying only in the grammar of a few of the speakers(p.325).

2.4 Wh-word Use in Question and Relative Constructions

From two low proficiency adult learners' data, Hoekje (1988:156) found a split in the use of Wh-word in the question construction (both direct and indirect question constructions) and the relative constructions (free relatives and relative clause). Question constructions show the use of Wh-words in initial position in the clause almost uniformly. They show the emerging use of Wh-word in free relatives in their second samples but relative clause constructions show almost no use of Wh-words or evidence of a complementizer generally.

The question that arises is whether Wh-words in question constructions and relative constructions are the same. Do they perform the same function? Are the gaps of Wh-words in the two constructions of the same kind?

There is no doubt that THAT is a complementizer in relative clauses. Radford (1988:481) provides strong evidence to demonstrate that THAT is a complementizer not a Wh-relative. However, he starts from the similarity between Wh-relatives and THAT in relative clause. Compare sentence in 17 with sentence in 18.

17. a. someone [WHOM I met --]
    b. the book [WHICH I read --]
    c. the day [WHEN we went to Paris --]
    d. the place [WHERE we stayed --]
    e. the reason [WHY I went there --]

18. a. someone [THAT I met --]
    b. the book [THAT I read --]
    c. the day [THAT we went to Paris --]
    d. the place [THAT we stay --]
    e. the reason [THAT I went there --]

Wh-relatives in 17 function just like the complementizer THAT in 18. However, Wh-words or phrases in sentence initial position in the question constructions do

not seem to belong to functional categories, but lexical categories instead. Wh-words in relative clauses seem like functional categories. They share some of the features of functional categories proposed by Abney (cited by DeVilliers et al, 1990). They are generally unstressed phonologically or even phonologically null. They lack "descriptive content," contributing less basic semantic information. They are the sort of words that get omitted in a telegram. In traditional grammar, they are called relative pronouns, or relative adverbs which function as a link between the matrix sentence and the clause. When a relative pronoun is derived from an object position, it is often omitted, as in sentences and 20.

19. I know the man who is talking to the professor.

20. They like the food (which) I cook.

As for the Wh-word in free relatives, they seem to be in a position between lexical and functional categories. They provide semantic meanings and function as a link introducing a clause as well.

Note that sentence 7 is repeated insentence 21:

21. I have read what he has written.

WHAT in sentence 21 is the object of "read" but also serves as a link to the clause. WHAT plays two roles equivalent to "the books which," having features of both lexical and functional categories.

Some linguists argue that a major source of cross-linguistic variation lies in differences in the functional categories, with lexical categories being universal in form (deVilliers et al, p.8). It is also predicted that functional categories should be late in acquisition as they require specific input to "set" the parameters for the language being learned.

The acquisition data from Hoekje's study seem to support that Wh-words in question construction are easier to acquire than those in relative clauses, and Wh-words in free relatives occur in between, which is consistent with the assumption that functional categories are late in acquisition.

The other question that is worth mentioning is the nature of the empty categories in these constructions in learners' interlanguage. Since the learners' native language in this study is Chinese, a look at some of the empty categories will help to understand L2 acquisition.

2.5 Pro-drop and Null Objects in Chinese

Adopting McLugan's (1964) analogy of "hot-cool" division of the media, John R. Ross (1982) extends it:

"...classifying languages on the basis of the explicitness with which they express certain anaphoric elements. For example, English may be said to be a 'hot' language because pronouns cannot in general be omitted from grammatical sentences and the information required to understand each sentence is largely obtainable from what is overtly seen and heard in it. On the other hand, Chinese may be said to be a very 'cool' language in that such pronouns are usually omissible (and are often more naturally omitted) from grammatical sentences, and understanding a sentence requires some work on the reader's or the hearer's part, which may involve inference, contest, and knowledge of the world, among other things." (cited by Huang 1984)

Huang (1984) thinks that the difference between "hot" and "cool" language may be derived from a more general typological parameter proposed by Tsao (1977, cited by Huang). Languages like Chinese are "discourse-oriented" and languages like English are "sentence- oriented." In other words, sentences in Chinese which are seemingly ungrammatical are acceptable in appropriate contexts. Not

only can subjects be deleted in Chinese (i.e a pro-drop language) but also objects. See the following example from Huang (1984):

22. Speaker A: Zhangsan kanjian Lisi le ma?
Zhangsan see Lisi LE Q
'Did Zhangsan see Lisi?'

Speaker B: a. ta kanjian ta le
he see he LE
'He saw him.'

b. [e] kanjian ta le.
'[He] saw him.'

c. ta kanjian [e] le.
'He saw [him].'

d. [e] kanjian [e] le.
'[He] saw [him].'

e. wo cai [e] kanjian [e] le.
I guess see LE
'I guess [he] saw [him].'

f. Zhangsan shuo [e] kanjian [e] le.
Zhangsan say see LE
'Zhangsan said that [he] saw [him].

Subjects can be dropped not only in the matrix sentence but also in embedded sentences and the same is also true for

the object in Chinese. The counterparts in English of sentences b to f are not acceptable at all. All the gaps in the above sentences resulted from deletion, unlike the gaps in Wh-questions in English, which are derived from movement.

Another intepretation of why subjects can be dropped in Chinese is that Chinese is also a pro-drop language. Languages like Italian and Spanish do not obligatorily require a subject in a sentence because the inflection (INFL) in these languages is so rich that it can determine the reference of the missing subject. The INFL in English is not as rich as that in these languages so subjects can not be ommitted in a sentence. As for the INFL in Chinese, Huang (1982b:482) thinks that it has much more lexical content to it than the INFL in English. Aspect markers in Chinese are derived from lexical categories and may be used as independent lexical items. The INFL in Chinese is assumed to be a proper governor, on a par with other lexical governors. Therefore, subjects are properly governed as much as object[5].

In terms of object gaps, White (1990) suggests that adult Chinese L2 learners of English may treat the gaps in English in the Subjacency task as small pros which result from deletion in Chinese, so Subjacency is not involved. Chinese L2 learners are likely to do so at the beginning stage. How long L2 learners need to realize that the trace

is left through Wh-movement depends on category features of Wh-phrases and structure complexity. From Hoekje's (1988) acquisition data, we know that Wh-movement in a simple question takes place early in adult Chinese L2 learners. Wh-movement in RCs and in complex sentences occurs very late.

The way Chinese learners treat gaps in Wh-questions in English is important, for it will help us understand why they are or are not sensitive to some particular universal rules, i.e., Subjacency and ECP.

We already know that even low-proficiency learners use Wh-movement in question constructions. Apart from the evidence of intonation and inversion to support the movement analysis, another piece of evidence is that learners never put resumptives in the question gap although they often do so in the relative clauses (Hoekje 1988).

From a discourse-oriented language where pronominal deletion in subject and object is acceptable, these learners begin to be aware that it is not acceptable in English. Hoekje also found that with the increase of their English proficiency, pronominal deletion decreases in the main clauses but resumptives increase in their relative clauses and main clauses (p.333), which indicates that they overgeneralize the English rule. The learners treat the Wh-words or null Wh-words as based-generated. However, they never retain a pronoun in the question gap which clearly

shows that Wh-words have moved to the clause initial position.

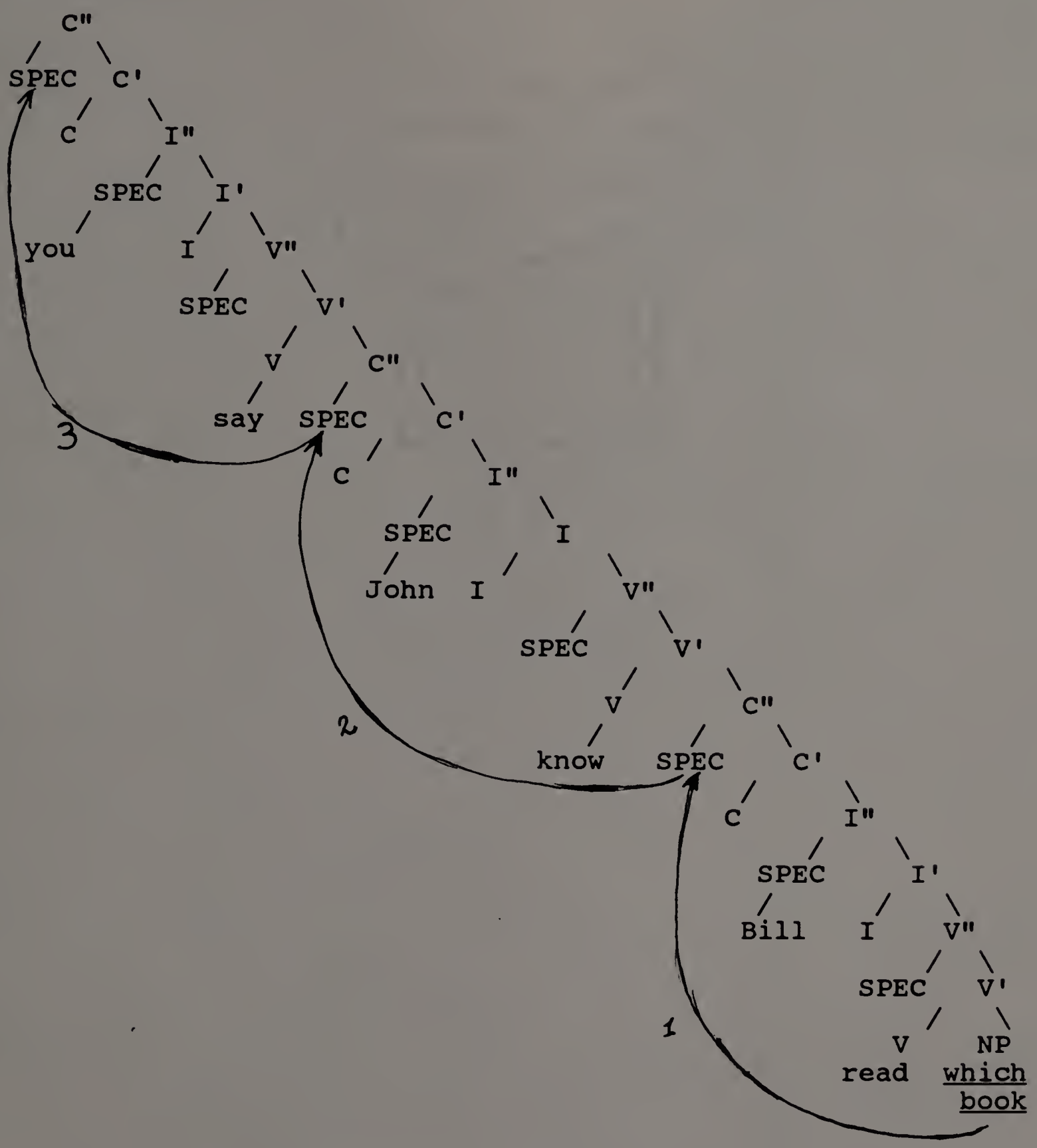
As mentioned above, Wh-words or phrases in questions have features of lexical categories which are easier for L2 language learners to acquire than functional categories are. This might explain why Wh-movement in simple question and indirect questions take place early in adult L2 acquisition. Wh-movement in these cases are clause-bound and we do not know whether Chinese learners of English have Long Distance Wh-movement, i.e. how they treat Wh-questions involving complex sentences.

2.6 Cyclic Movement

In 2.1 we see how a Wh-word moves to the SPEC-part of the COMP position. The Wh-word can also move from a considerable distance away, and is assumed to undergo cyclic movement in which it passes through the COMP nodes for the embedded sentences (DeVilliers et al 1990). It is sometimes called COMP to COMP movement. Look at the sentence in 22.

(22) Which book did you say John knew Bill read?

The underlying structure of this sentence is like the following:



By applying the cyclic transformation starting from the lowest clause and using SPEC-C as a landing site as in (1),

(2), and (3), WHICH book finally moves into sentence initial position. As no evidence has shown that Chinese has COMP, will Chinese L2 learners allow COMP-to-COMP movement in English? In some cases, a Wh-question might have two answers, as in sentence 23.

23. [COMP When did [S1 the boy say -- [COMP [S2 he hurt himself --]]]]?

WHEN in sentence 23 could modify either <u>say</u> or <u>hurt</u>. WHEN in the embedded clause can first move to the COMP for the embedded clause, then move the COMP of the matrix sentence. If L2 learners' L1 does not allow COMP-to-COMP movement and UG is not accessible to them, they are likely to have WHEN modify <u>say</u>. It is impossible for them to have WHEN modify <u>hurt</u> if their L1 does not allow COMP-to-COMP movement.

Recent linguistic theory has suggested some constraints on movement which have never been taught, for even language teachers are not aware of them. Are L2 learners of English sensitive to the constraints once they have Wh-LD movement? To resolve this issue, a look at L2 learners' native language--Chinese--is necessary.

If it were like Spanish or French that have Wh-movement in syntax, Chinese would be subject to movement constraints and Chinese learners of English would transfer their L1 feature to their L2. They are expected to perform the task

as well as the native speakers when they reach a certain proficiency level of a target language. However, Chinese does not observe Wh-movement in syntax, therefore Subjacency does not apply. Adult Chinese learners of English will not be sensitive to these constraints at all if UG is not functioning in them. If they are, we might suggest that UG is operating and these learners realize the UG principles as they interact with English at a certain level.

2.7 Partial Wh-movement

Sentences like 22 & 23 involve Wh-LD movement (deVilliers and Roeper 1988) or full Wh-movement (Mcdaniel 1991) in which a Wh-phrase has moved from the embedded clause to its CP, and then to the highest CP of the sentence. However, languages like German have partial Wh-movement in which a Wh-phrase from the embedded clause moves to the CP of the clause while the SPEC of the [+Wh] CP is obligatorily filled by "was" (Mcdaniel, 1991). Examples follow.

24. a. [Mit wem]i glaubt [ip Hans [cp ti dass [ip Jakob jetzt ti spricht]]]?
With whom does Hans think that Jakob is now talking?

b. Was i glaubt [ip Hans[cp [mit wem]i [ip Jakob jetzt ti spricht]]]?
WHAT does Hans believe with whom Jakob is now talking?

In sentence 24b, Mcdaniel (1989) glosses WAS as WHAT and refers to it as a scope-marker and the Wh-phrase "with whom" moves to the lower CP, but the meaning of the sentence is the same as sentence 24a. So German observes partial Wh-movement while English does not. In the process of acquiring Wh-LD movement in English, both English-speaking children and adult L2 learners might have more options to answer the Wh-questions. Take the following story for example.

The dog got a very big meat bone from the garbage can. He made sure no one was watching, then he buried it in the back yard. But late at night, the neighbor's cat sneaked in and dug it up, leaving a pile of dirt. In the morning when the dog saw the dirt, he gave a big howl to tell everyone, "Someone stole my bone last night!"

When did the dog say -- how his bone was gone -- ?

As deVilliers points out, several options exist for the English child in answering this question. If the child allows Wh-LD movement, he would use WHEN to modify the

embedded clause and answer "late at night." If the child copies the Wh-word in medial, he would use HOW to modify the matrix clause and answer "The dog gave a big howl to tell everyone." If the child permits partial Wh-movement, he would use HOW to modify the lower clause and say, "The neighbor's cat stole it."

Roeper and deVilliers (1988) have found in their study that quite a large percentage of preschool children's responses allow partial Wh-movement in English. In other words, instead of answering "when", they answer "how". As they grow older, the percentage permitting partial movement dramatically declines. Although coying or answering the Wh-word in medial is not grammatical in English, as is suggested (Weissenborn, 1991), this behaviour is part of UG because a restricted form of it can occur in German.

In the study being reported here, another question is asked apart from the one above. That means that informants are pushed to think of more options. Will the Chinese adult L2 learner also pass through the stage of permitting partial Wh-movement in their acquisition of Wh-LD movement in English?

2.8 Subjacency in Chinese

Subjacency is considered one of the UG principles that applies at S-structure. Descriptively speaking, Subjacency

constrains movement, i.e., the application of move a, in such a way that an element may not be moved across more than one bounding node at a time (Bley-Vroman, 1988).

The Subjacency condition can be formulated as follows:

No rule can relate X, Y in the structure

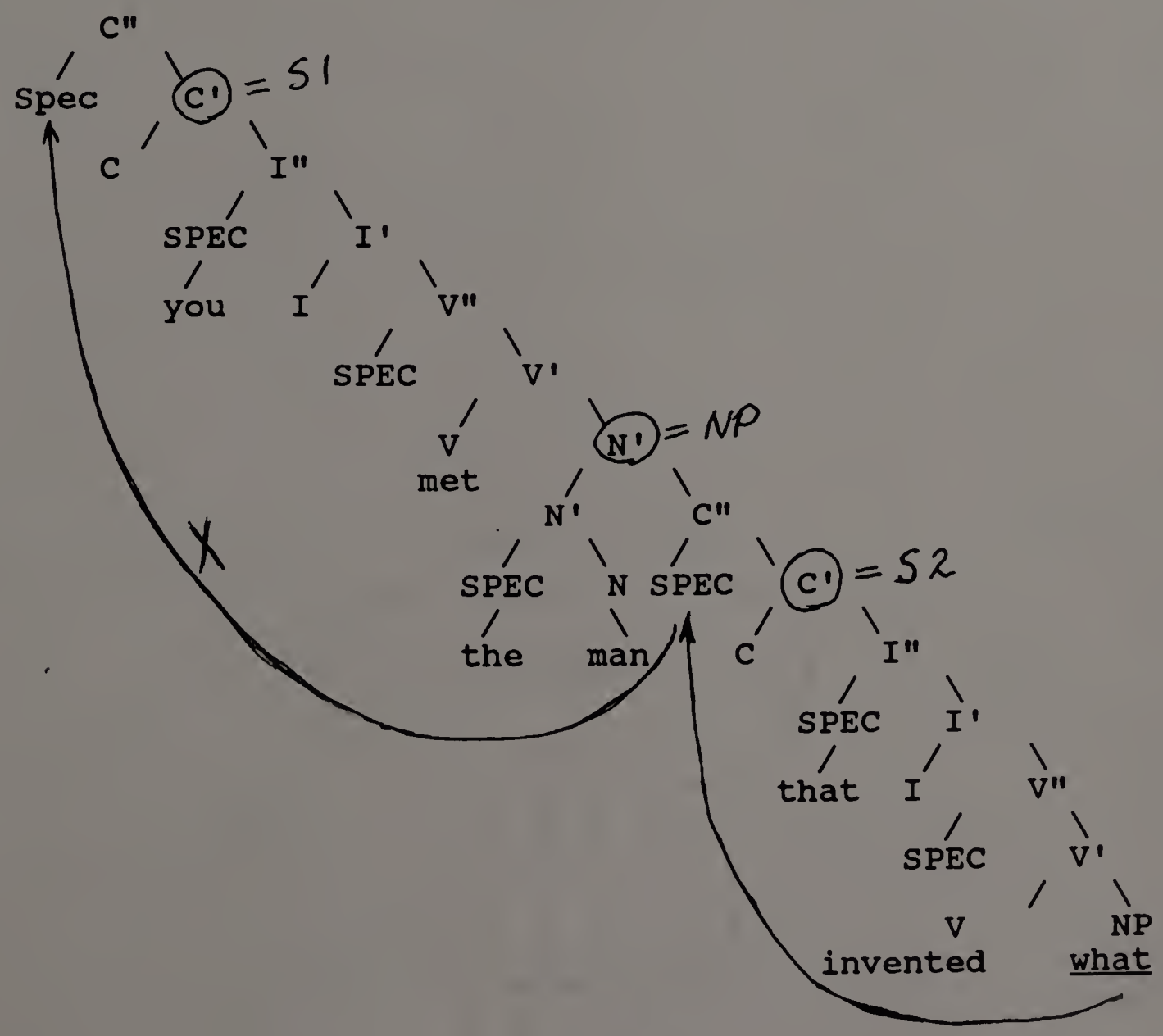
...X...[a...[b...Y...(or ...Y...]b...]a...X...)

where a and b are bounding nodes (Van Riemsdijk and Williams, 1986)

Here is an example:

25. * What have you met the man that invented--?

The D-structure of the sentence looks like this:



For WHAT to front this sentence, it has to cross three bounding nodes, first crossing S2 and landing on the COMP site; second moving to NP where there is no landing site for WHAT so its movement is blocked. We also know that in English NP and S are bounding nodes, and an element cannot move across more than one bounding node at one time. Wh-movement in this sentence violates Subjacency, resulting in an ill-formed sentence.

Subjacency consists of several island conditions: Complex Noun Phrase condition (CNPC); Sentential Subject Condition (SSC); Wh-Island condition and NP-Island condition.

Unlike English, Chinese does not observe movement at S-structure when Wh-questions are formed. Then the question arises whether or not the constraints that block Wh-movement in English have any effect on Chinese Wh-questions. Of many constraints, Subjacency is assumed to be universal. Huang has shown some evidence that other structures in Chinese such as A-not-A and cleft structures observe Subjacency (Huang 1982a and 1982b). However, the question of whether Subjacency plays a role in Wh-questions in Chinese was controversial for quite a while.

Huang found that although some of the Wh-questions are not acceptable, this unacceptability is due to constraints other than Subjacency.

26. *[[[tou-le sheme de] <u>neige</u> ren] bei dai-le]?

steal what de <u>that</u> person by caught

"The man that stole WHAT was caught?" (Huang,82)

27. * [ni du-le [[sui xie de] zhe ben shu]?

you read who wrote de this book

" Who wrote this book did you read?"

Both 26 & 27 contain a demonstrative pronoun <u>neige</u>. Huang thinks that it is the specificity condition (Fiengo and Higginbotham, 1981) that does not allow a specific NP to contain free variables. Once the demonstratives are deleted, we obtain the following sentences which are grammatical although both violate Subjacency. In sentence 28, Sentential Subject Condition (SSC), and in sentence 29, Complex Noun Phrase Condition (CNPC), are violated.

28. [[[tou-le sheme de] ren bei dai-lei]?

steal what de person by caught

29. [ni du-le [[shui xie de] shu]?

you read who wrote de book

Huang also noticed that some sentences violating Subjacency are acceptable but others are not. Compare sentences 30 & 31.

30. [[ta tao lun [sheme shu]] zui youqu]?

he discuss WHAT book most interesting

"He discuss WHAT book is most interesting?"

31. *[[ta weisheme xie] de shu] zui youqu?

he why wrote DE book most interesting

"Books that he wrote why are most interesting?"

(Nishigauchi 1986)

The matrix sentences of 30 and 31 are the same, both having a sentential subject, but 30 is good and 31 is not acceptable according to Huang. Unlike English, Chinese does not have subject-object asymmetry with respect to Wh-movement but has argument-adjunct asymmetry. He first referred to this feature as "objectivity of the Wh-word." Wh-words like WHAT, WHICH, and WHICH have this feature because they can be an object of a verb or an object of a preposition. They are different from non-objectual Wh-words such as WHEN, WHERE, HOW, and WHY, which cannot replace an object. Because of this objectual feature, Wh-questions containing WHAT, WHO, WHICH, may escape CNPC effect. The Wh-word in sentence 30 "sheme" (WHAT) has the objectual feature; therefore, it is still acceptable even though the Wh-word has moved across more than one bounding node at LF while in 31 "weisheme" (WHY) does not have this feature and it is considered ungrammatical.

The conclusion Huang reached is not that English has Subjacency while Chinese does not, but that syntactic movement obeys Subjacency whereas LF movement does not in both English and Chinese (Lasnik & Uriagereka, 1988b:107).

Wh-questions in Chinese do not involve syntactic movement and Wh-words or phrases are in situ (i.e., they occupy the positions in which their non-Wh counterparts would be placed):

32. Women zai nar chi yecan?
we at where eat picnic
"Where shall we have our picnic?"

(Radford 1988:502)

The same is true for Wh-questions in relative clauses. (See sentences 28, 29 and 30). Since Wh-words are not moved to the clause initial position in Chinese, Subjacency does not apply and Wh-questions in Chinese escape the Subjacency effect.

2.9 The Empty Category Principle (ECP)

It has also been found that Subjacency and ECP are two different principles (Lasnik and Uriagereka,1988). The problem in sentence 30 which cannot be accounted for by Subjacency can be explained by the ECP.

The ECP first proposed by Chomsky and later on modified by himself is:

A trace must be properly governed.

There are two ways in which a trace can be properly governed: (1) a head lexically governs its complement; (2) antecedent government: An antecedent governs b iff a binds b and a and b are not too far apart.[6]

The LF representation of sentence 31 is as follows:
[S'1 COMP WHY [S1 [NP [S'2 COMP t' [S2 he t xie] de shu] most interesting]

Since WHY is not a complement, we have to see whether its trace is governed by its antecedent. The intermediate trace, t', governs t but t' is not properly governed, for the matrix COMP is too far away from its immediate trace and S and NP intervene between the antecedent, WHY, and its intermediate trace "t'," resulting in an ill-formed sentence.

Based on ECP, Lasnik and Saito (1984) proposed a y-marking mechanism that suggests ECP is applied at both syntactic and LF levels.

*[... [-y]...]

The assignment of [+y] feature obligatory takes place at S-structure and at LF. At each level, [+y] is assigned to a trace that is properly governed, and [-y] is assigned to a trace that is not properly governed.

To instantiate proper government:

a. arguments can be y-marked at s-structure;

b adjuncts can be y-marked at LF.

In sentences 28, 29, and 30, arguments WHAT and WHO get y-marked at s-structure while WHY in sentence 31 has to get y-marked at LF, but fails to get properly governed.

It seems that Subjacency plays no role in Chinese Wh-questions but it is ECP that restricts move a. Arguments escape the island effects because they are lexically bound. WHAT in sentences 28 & 30 is the object of a verb, so the verb is the governor. WHO in sentence 29 appears in the subject position; it is governed by INFL. Subject position in Chinese is always well governed by INFL, and INFL and subjects in Chinese have a special relation while INFL does not have this relation with adjuncts. However, this still leaves unexplained some good sentences with adjuncts that are considered to violate Subjacency.

33. [ni xiang kan[[ta shemeshihou pai de] diaying]]?
you want see he when film movie
"You want to see movies that he filmed when?"
(Huang,82)

Sentence 33 is good and some other sentences with "WHEN" and "WHERE" are also good. On another occasion, Huang suggests that maybe WHEN AND WHERE are not adjuncts, but may be considered arguments. His first evidence is that both WHEN and WHERE can be objects of some prepositions while other adjuncts cannot. It is all right to say "since when,"

"from when to when," "from where," but we cannot put any prepositions before HOW and WHY. Another piece of evidence he gave shows the WHEN and WHERE pattern on a par with WHO and WHAT.

34. [ni xiang zhidao [Lisi zai nali mai-le shime]]?
    you wonder Lisi at where buy what

35. [ni xiang zhidao [Lisi zai shimeshihou mai-le shime]]?
    you wonder Lisi at when buy what

36. [ni xiang zhidao [shei weisheme da-le Zhangsan]]?
    you wonder who why beat

37. [ni xiang zhidao [shei zeme pian-le Zhangsan]]?
    you wonder who how cheat (Huang,82)

Arguments have wide scope. Both sentences 34 & 35 ask two questions: WHERE and buy WHAT in 34, and WHEN and buy WHAT in 35. According to Huang, sentences 36 & 37 each ask only one question because the arguments WHO takes wide scope over WHY.

Basically, Huang suggests that arguments are different from adjuncts in Wh-questions in which an argument Wh-word can be properly governed by its head or its antecedent while adjuncts can only be governed by their antecedents. Because

of this, argument Wh-words can escape island effects while adjuncts cannot.

Look at the following English sentences:

38. Who did the boy ask how to help -- ?
*39. Who did the girl ask what to throw -- ?
*40. How did mother learn what to bake -- ?
*41. When did the boy say how he hurt himself -- ?

The dashes (--) in 38-41 refers to the site in which the Wh-word originated. In light of the Subjacency condition, all these sentences should be ruled out, for they all violate the Wh-island condition: no constituent can be adjoined to a COMP which already contains a Wh-constituent (Radford 1981). The COMP position for the embedded clause has been filled with a Wh-word which blocks the Wh-word to move to the initial COMP. However, 38 is still acceptable to many native speakers. According to ECP, the empty category "--" is properly governed, since WHO is an argument and its trace is governed by the verb help. Arguments have to be subcategorized by verbs or prepositions but adjuncts can freely join the VP. Adjuncts need to be antecedent governed. When the medial COMP is filled, its trace cannot be governed, thus violating ECP. But why is 39 not acceptable?

In sentence 39, the trace of WHO is not properly governed; the head of the VP "throw" only governs the trace

of WHAT when it moves to the COMP for the embedded clause. The head of VP might be able to govern only one NP. If this is so, the trace of WHO also fails to get antecedent-governed because WHAT in the lower COMP blocks the government, resulting in an ill-formed sentence.

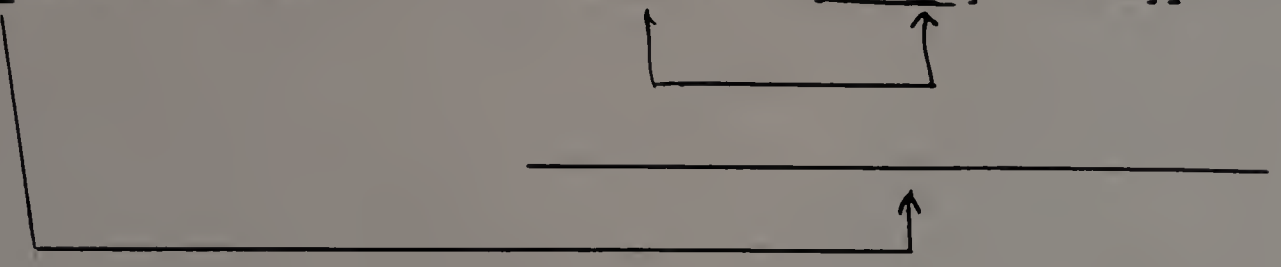
2.10 Alternative Explanation

Along a seemingly different line, Nishigauchi (1986) argues that Subjacency also applies to Japanese in Wh-movement at LF with his pied-piping analysis. He gave sentence 42, which is a fully grammatical sentence in Japanese, as an example. He thinks that the LF representation of sentence 42 is not 43, which exhibits Subjacency violations, but rather something like sentence 44, where the complex NP that contains the Wh-expression moves to COMP, as well as the Wh-expression itself, which moves within the complex NP.

42. Kimi-wa [[dare-ga kai-ta] hon]-o yomi-masi-ta ka?
    you -T who -N write-P book -A read -P -Q
    'You read books that who wrote?'

43. You read [[x wrote] books] [Comp who x ka]

44. [y are interesting][np[[s x wrote]WHO x] books]y



(p.62)

The restriction he proposes in the movement of the Wh-expression is that a Wh-phrase must be identical in syntactical category to the dominating node in order for the [+WH]-feature to be percolated to the latter. In other words, the WH must be at least [+N] in the sense of the X' feature system in order for the [+WH] to climb up to the complex NP (p.120).

In light of this pied-piping theory, Subjacency still applies to Wh-questions in Japanese and presumably also in Chinese and Korean.

In his theory, the Wh-features have no problem percolating to the complex NP in the following sentences:

45. shei xie de shu zui yoqu?
    who wrote book most interesting

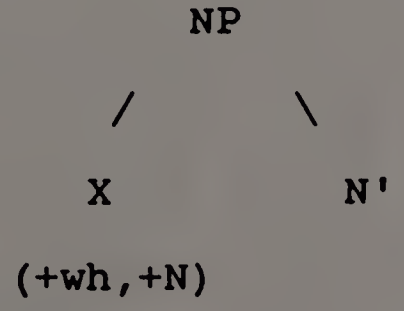
46. ta xie shime shu zui yoque?
    he wrote which book most interesting

47. ta zuo-le shime she ni shengqi
    he do what make you angry

Since the Wh-words in these sentences are WHAT and WHICH they do not conflict with the category of NP which has a quantificational force. WHEN and WHERE in Japanese do not present any problems because they have the [+N] feature--"at what time," "at which place." It seems that Nishigauchi has used the same line of analysis as Huang's when considering WHEN and WHERE NPs. However, WHY and HOW can also be interpreted as "for what reason" and "in what manner," respectively, but the following sentence is considered bad:

*48. ta wei shime xie de shu zui yoque?
he why wrote book most interesting

According to Huang, this sentence is not acceptable and he thinks ECP can provide the reason it is ungrammatical. Nishigauchi thinks that WHY is not identical in syntactical category with the dominating node for the [+WH]-feature to be percolated as in 45, 46 & 47.



He further suggests that WHY is not a variable as are other Wh-expressions which can be unselectively bound by

question-elements as is shown by the following sentences (p.131):

49. *[Kare-ga naze ki-te-mo] boku-wa aw-anai.
he-N why come -Q I -T meet not
"No matter why he comes, I will not meet him."

WHY is not quantificational in character.

Strangely enough, the equivalent of this sentence is perfectly acceptable in English and in Chinese as well.

If "for what reason," which is semantically equivalent to WHY, replaces WHY in 48, we will get a grammatical sentence as Huang shows(1982b:527):

50.[np[s ta wei-le sheme yuanyin xie] de shu] zui youqu?
he for what reason write book most interesting

The difference between 48 & 50 is that the Wh-expression "for what reason" (wei-le sheme yuanyin in 50) is an argument while WHY (wei shime in 48) is an adjunct. Nishigauchi found the same contrast in Japanese.

Another [-N] Wh-expression HOW also remains a problem in terms of his theory. He agrees that the following Japanese sentence is acceptable.

51. [np[s kare-ga [np donna riyuu] -de kai-ta] hon] -ga
he-N what reason for wrote book -N
omosiroi desu-ka?
interesting is -Q
"Books that he wrote how are interesting?"

Doo-yatte (HOW) is capable of being unselectively bound by the question-element "mo." He failed to explain why HOW which is [-N] in nature can be percolated.

To summarize, Huang and Nishigauchi use different mechanisms to intepret the grammaticality of Subjacency violation sentences in Chinese and Japanese respectively. Huang distinguishes Wh-arguments from Wh-adjuncts in Chinese and suggests that some adjuncts like WHEN and WHERE are actually arguments in nature. Therefore, the gaps of WHEN and WHERE are well-governed. Nishigauchi adopts the percolation device for the noun phrase to climb up in which WHEN and WHERE are also considered noun phrases, so the extraction of them is acceptable. Both explanations are effective to account for some Subjacency violation sentences in Chinese and Japanese. However, they leave some questions unsolved.

First, if WHEN and WHERE can be considered noun phrases in Chinese, the same reason should apply to English too. But the English version of sentence 33 is not acceptable.

Second, in the same line HOW and WHY should also be considered noun phrases because they can be translated as "in what way" and "for what reason". Then there would be no distinction between arguments and adjuncts.

Recently many linguists have recognized that Subjacency is a constraint for movement at s-structure not at LF level. Lasnik and Uriagereka (1988:108) think that the basic phenomenon Huang tries to explain has nothing to do with Subjacency. The generalization Huang argues for is this: if a complement moves in LF, it can do whatever it pleases, but if a noncomplement moves, then it is constrained by a locality condition that is not Subjacency, namely the ECP.

2.11 Topicalization in Chinese

Topicalization in Chinese is the area in which subjacency is assumed to be observed. But evidence from Xu (1986) argues against this assumption.

52. zheben shu [[du guo - de] ren] bu duo.
this book read man not many
"There aren't many people who read this book."

53. zheben shu wo mei jian guo yige[[neng dudong - de] ren]

this book I not see one can read-understand man

"I haven't met anyone who can understand this book."

The relation between a topic and its gap in 52 & 53 clearly violates Subjacency but the sentences are acceptable. Xu also showed that the equivalent in Japanese and Korean are well formed despite violating Subjacency. Probably, syntactical movement is not involved in 52 & 53 where topic is base-generated so Subjacency is irrelevant. Xu suggested that topic structures in Chinese are derived without Wh-movement,(Xu and Langendoen, 1985).

2.12 Summary

For the reasons mentioned in 2.1 and 2.2, Wh-movement in simple questions does not present a problem for the Chinese L2 learners. It is also assumed now that Chinese does not have COMP. Do Chinese L2 learners have Wh-LD movement in English ? Do they allow Wh-LD movement when the COMP of the embedded clauses is filled?

Hoekje (1988) concludes in her study that Wh-movement in a relative clause is late learned and not all the L2 learners in her study have learned it. It is plausible to

assume that the knowledge of Wh-questions involving relative clauses comes even later. What is more, Chinese does not have syntactic Wh-movement and Subjacency is a constraint on movement. Do Chinese L2 learners observe Subjacency in English when they reach a certain English proficiency level?

The Chinese language has null objects and the acquisition data by Chinese L2 learners of English has shown their L1 interference in learning English. With the improvement of their English, deletion of objects in the main clause is decreasing and retention of objects in the main clause and relative clause is increasing. Do Chinese learners treat object gaps as small pros in their interlanguage?

Some problems can not be explained by Subjacency but can be solved by ECP which is basically concerned about different treatment between argument and adjuncts. Young children in DeVilliers and Roeper's study are able to distinguish between arguments and adjuncts in Wh-LD movement tasks. Do Chinese L2 learners demonstrate this distinction?

Some issues are related to both L1 interference and development errors in L2 acquisition. Since Chinese is considered to lack COMP and Hoejke's study has shown that they move the Wh-word to clause boundary, we will assume that Chinese L2 learners might answer Wh-medial questions. In Devilliers and Roeper's study(1989), children gave

answers to the medial Wh-questions which English adults do not allow. For example:

54. How does the boy know where to go?

Three-year-old children are likely to answer "to school." Do adult Chinese L2 learners respond in the same way as children?

CHAPTER 3

L2 RESEARCH ON SUBJACENCY AND THE ECP

Although many studies have tested the sensitivity of Subjacency and the ECP on L2 learners from various native language backgrounds (White,1988; Bley-Vroman, Felix and Ioup, 1988; Felix, 1988; Johnson, 1988; Schachter,1988), the results have been inconsistent. There is little debate about the sensitivity to Subjacency for Spanish, French, and German L2 learners, because these native languages observe Subjacency. This abstract rule of L1 seems to be transferred to English unconsciously when L2 learners have reached a certain English proficiency level. On the other hand, for L2 learners whose native languages do not obey Subjacency, there is currently no consensus. Tests of learners' sensitivity to Subjacency produced different results, hence leading to different interpretations.

As White (1990) noticed, native speakers of Spanish, Dutch and French more accurately detect Subjacency violation in English than do native speakers of Chinese, Korean, or Japanese. Nevertheless, some studies show that Korean and Chinese L2 learners performed the task above chance level (Bley-Vroman et al. 1988), while others have found these learners performed the task randomly (Schachter 1988). As a

result of these inconsistencies, researchers have drawn opposite conclusions.

There are now three theories. One maintains that UG is still available to adult L2 learners because they can identify ungrammatical sentences which violate abstract universal rules without being taught formally or informally. It is argued that it is not possible for L2 learners to learn the UG principle through language input because of lack of negative evidence. Native speakers do not use sentences with Subjacency violations, and in fact, in L2 learners' interlanguage, it is rare to find sentences with Subjacency violation. Hoekje (1988) found only one such sentence in her data collected from six L2 learners for one year. This shows that these universal principles are still operative in adult L2 learners when their L1 does not observe this rule. Several studies support this theory (White,1988; Felix,1988; Flynn,1987; Bley-Vroman et al., 1988). Almost all these studies have found that L2 learners' performance on the tasks is above chance level, although they do not do as well as native speakers.

Another theory held by several researchers (Johnson 1988; Schachter 1988; Johnson & Newport, 1991) claims that UG is only partially operative in adult L2 learners as age effects are shown in their performance. Johnson (1988) held that L2 learners' ability to grasp language specific rules as well as to realize UG rules gradually declines as they

grow older. In other words, maturation affects performance in both tasks.

Schachter (1988) has recently presented a "window of opportunity hypothesis" for L2 acquisition by which she means that there is a period of time when fixing up a principle -- Subjacency, for instance -- is possible (before puberty). If the parameter is fixed, Subjacency is available to the L2 learners in future use, and if it is not fixed during that time, the L2 learner's UG will not be characterized as one where this UG principle is incorporated. If a L2 learner is not exposed to a particular structure within this time, the window of opportunity is closed.

She has found that the Korean speakers performed randomly on the Subjacency task in her study because these L2 learners started learning the target language too late, missing the "window of opportunity." The Chinese L2 learners did better than Korean speakers because Subjacency partially applies in Chinese[7] and thus she concludes that UG is partially available to these learners.

Some researchers (Clahsen and Muysken, 1986) oppose the above theories and propose that UG, the abstract principles governing all languages, does not aid adult L2 learners. They found that adult L2 learners learn German word order, agreement, and negation in a different pattern from German children acquiring their native language: the children have

direct access to UG and their acquisition can be explained by the parameter theory of language development while adult L2 acquisition may be defined in terms of information processing and general problem solving (Clahsen and Muysken, 1989). Schachter (1988) found that Korean L2 learners' results on Subjacency judgement tasks are below chance level because Subjacency does not apply to Wh-movement in Korean. Therefore, UG is not available to those adult L2 learners whose native language does not observe subjacency.

One of the hypotheses Johnson and Newport developed in their study is to see whether Chinese learners' performance in identifying the ungrammaticality in yes-no question structures was better than their performance in identifying Subjacency violation structures. If UG is still operative, L2 learners' performance in a Subjacency task will be superior to that in the yes-no structure, for the yes-no question structure involves a language-specific rule while Subjacency is a UG rule. When they fail to find their subjects' performance on a Subjacency task superior to that on the yes-no structure, they conclude that maturation affects the adult L2 learners.

Although Johnson and Newport used parallel structures in testing L2 learners' knowledge of yes-no and Subjacency violation structures, they neglected to observe that the yes-no question structure, involving a language-particular rule, can be explicitly taught and emphasized in formal

instruction. As is known, the teaching of grammar in language instruction is very popular. In the judgment task, L2 learners can utilize all their knowledge and strategies to detect ungrammatical sentences. To detect Subjacency violations, a more sophisticated knowledge of English is involved and there is no way other than UG enabling them to find out the ungrammaticality. Therefore, the comparison of their performance on these two structures does not conclusively prove if L2 learners still have access to UG.

When we take recent accounts of linguistic facts into consideration, the hypotheses may have to be modified. Subjacency in Chinese is a case in point. At first Huang (1982) tried to show that Subjacency applies to Chinese Wh-questions even when there is no syntactic movement in Wh-question formations in Chinese. Later linguists (Lasnik and Uriagereka,1988) argued that Subjacency applies only at s-structure, not at LF level. That means that Subjacency does not play a role in Chinese Wh-questions. Other linguists (Xu and Langendoen 1985) also found that topicalization in Chinese does not seem to obey Subjacency and they suggest that the topics in these structures are probably base-generated rather than generated through movement. Based on these suggestions, Schachter's interpretation, that Chinese perform better than Koreans, does not hold since Subjacency simply does not apply at LF and it is impossible for the Chinese informant to transfer this UG principle from his or

her native language. Besides, she failed to explain why Indonesian informants do not do better than the Chinese as the native language of the former group observes Subjacency while Chinese obeys Subjacency only partially.

Although ECP is one of the rules tested in several above mentioned studies (Bley-Vroman and Felix,1988; White,1988), no study has yet given a full account of ECP and the difference between Subjacency and ECP.

First of all, Subjacency and ECP are two separate principles and apply at different levels: Subjacency applies only at the syntactic level while ECP applies at both the syntactic and LF level. Lasnik and Saito (1984) proposed that complements such as WHO, WHICH, and WHAT are lexically governed at s-structure but non-complements such as HOW, WHERE, WHEN, and WHY are antecedently governed at LF. Many linguistic facts suggest that sentences violating ECP are more unacceptable than that of Subjacency. In deVilliers and Roeper's study (1989), four to six-year-old children distinguished between arguments and adjuncts in Wh-long-distance movement: 30% of the responses to the initial argument (question 1) vs. only 6% - 8% of the responses to the initial adjunct (question 2).

1. Who did you ask how to paint--?
2. How did mother learn what to bake--?

Although both questions 1 and 2 violate the Subjacency condition, question 1 is accepted by many native speakers while question 2 is not. In question 1 the verb "paint" subcategorizes for an object and the fronted object WHO is governed by the head of the verb phrase (VP), paint, so this sentence is grammatical. However, the second gap of HOW is not properly governed: it can not be lexically governed, furthermore, its antecedent is too far away from the second gap, so question 2 is not acceptable.

In the above Subjacency studies, a question like 1 is considered ungrammatical (Bley-Vroman and Felix 1988; White 1988; Johnson 1988) and we do not know how informants behave on each Wh-island violation sentence so the statistical analysis may not be accurate. With the new linguistic analysis, it is very likely that we will obtain knowledge about L2 acquisition if we can find out whether adult L2 learners are sensitive to the differences between questions 1 and 2.

As mentioned above, previous studies do not distinguish ECP from Subjacency and give the impression that ECP is just like Subjacency. With the new linguistic analysis, we will assume that informants, regardless of language background, will not have any problem identifying sentences with ECP violation as this rule is applied at both s-structure and LF level, i.e., all languages obey ECP while all languages do not obey Subjacency in Wh-questions. Take Chinese adult L2

learners for example: Subjacency does not apply in Wh-questions in Chinese because there is no syntactic movement in Wh-questions. As for ECP, it applies at both levels; no language will escape this principle. Will Chinese L2 learners be more sensitive to ECP than Subjacency?

Although ECP has been tested in several studies, almost all of them have dealt with ECP using that-trace-effect and superiority effect structures[8]. Reoper and deVilliers have extensively studied Wh-long-distant movement in child language acquisition and have discovered patterns of children acquiring Wh-questions. However, no study in L2 acquisition has yet touched Wh-long-distance movement involving both Subjacency and ECP violations.

In terms of the sentence structure, sentences with Subjacency violation will include the Complex Noun Phrase condition (CNPC), the Sentential Subject condition (SSC), NP islands and Wh-islands[9]. All sentences involving ECP are WH-LD movement sentences which include questions with initial arguments and adjuncts and with both arguments and adjuncts in medial, and questions with small clauses and NP nominalizations. With seemingly similar structures, we will see whether adult L2 learners are sensitive to these two different UG principles and whether they will treat them differently. Because the informants in this study are at different English proficiency levels, we will see whether their sensitivity to UG principles correlates with their

English level. Then we can determine whether there is an order in acquiring the UG rules in different structures.

Due to the fact that the informants in this study are Chinese speakers, Johnson's study (1988) and Schachter's study (1988) will be considered here since Chinese speakers are included in their studies. Apart from the limitations of the linguistic analysis, differences in methodology also give rise to alternative interpretations.

Johnson was curious to know why her Chinese informants did not do as well as those in Schachter's study when both studies tested their informants' sensitivity. These differing results may be due to the way informants were selected and the type of Subjacency judgment tasks used. The informants in Schachter's study were in an advanced English class while those in the former were selected according to their years of residence in the United States. In Johnson's study, all the subjects had been in this country for at least five years at the time of study and all of them were graduate or post-doctoral students or faculty. Johnson (1988) mentioned that previous studies have shown that for length of experience with the language, adult learners of a second language, after five years of immersion in the target language, show no effects (Oyama 1978, cited by Johnson 1988). We still do not know the proficiency level of these learners since no external measures of second language proficiency were taken. Schachter found this to be a problem

in her studies and in other L2 acquisition studies(1989). The number of years of residence in the United States does not necessarily guarantee the improvement of the adult L2 learners' target language. Johnson found that her adult subjects spoke Chinese at home and spoke English in School.

In her longitudinal study, Hoekje (1988) studied three adult Chinese L2 learners who lived in the university Chinese community and found their L2 learning was affected by the moderately high social distance between the Target Language (TL) group and the Chinese group. This distance was reflected in the following ways: the TL group was socially dominant, vis-a-vis the Second Language Learner (SLL), in the eyes of both these communities; the SLL group was relatively large, with moderate enclosure and cohesiveness; the culture of the SLL group was relatively incongruent (non-Western, non-Judeo-Christian) vis-a-vis the large TL group (p.43-46).

Hoekje (1988) describes one informant's domains of English use as follows:

"Fen, a graduate student in fine arts at the university, was particularly isolated. As a painter working in an individual studio, Fen had little need for English, and he often described his days as passing without his speaking to anyone until he returned home. He met his advisor once every few months, and the secretary in his department several times a semester. He had several part-

time jobs during the time of the study--a restaurant job, where he did clean-up for the Greek owner, and a library job, where he worked on his own, reshelving books. In both these jobs, knowledge of English was little needed and seldom used. Fen socialized with a number of Americans through his graduate school program. His interactions with them totalled 10-15 hours/month."

Fen's case may not be very typical but with so many other factors involved in adult L2 learning, the number of years of residence in the TL country is not a good measure of a learner's Target Language. If we look at the individual chart for the test result in Hoekje's study, at least two of her 23 subjects said "yes" to almost all the test sentences. These subjects might not be suitable for this task.

Another possible factor that may affect subject performance is the listening comprehension test format. The subjects in her study started learning English when they were in their own country where English input was mainly through reading and very limited oral classroom interactions. They were naturally more comfortable with a reading comprehension task than with a listening comprehension test. Most of the listening comprehension test sentences involved complex sentences in question form, which added difficulty to the task for these learners. Furthermore, the test consisted of a total of 180 sentences and it is not mentioned how much time the subjects were

given to complete it. Fatigue may have been another factor that affected the subjects' performance on the test, if learners were asked to listen to it for more than 30 minutes at a time.

As for Schachter's study, Johnson found that, in her design, all questions were cases of violation of Subjacency and grammatical questions were not included. One could not tell whether subjects rejected sentences because they were questions or because they were violations of Subjacency.

In conclusion, because of the limitation of linguistic analysis, L2 studies have not focused on the difference between Subjacency and ECP; the sample size in the studies involving Chinese L2 learners has been relatively small and there have been other problems in methodology, such as selection of informants, selection of judgment tasks, and measurement of the informants' English proficiency level. The conclusion concerning the accessibility to UG of adult Chinese L2 learners is far from resolved.

Felix (1988) assumed that different principles may become accessible to L2 learners at different times. In other words, there may be an order in which these UG principles in different structures appear in L2 learners. There seems to be an order in parameter setting in child language acquisition. No adult L2 studies have been done on Subjacency and ECP to compare with that of children in their language development. If there is an order predicted, what

determines the order is another question. Information on this issue will benefit L2 pedagogy.

CHAPTER 4

METHODOLOGY

4.1 Informants

Informants for this study include two Chinese groups and one control group. Chinese Group 1 includes about 180 native Chinese sophomores in a university in China. All the informants were over 18 and were learning English as a foreign language at a university in Shanghai, China at the time of study. English proficiency was measured to insure that informants were ready for the judgment and comprehension tasks of this study.

This population was selected because of the group's homogeneity. This is very important because many studies using Chinese informants in the United States have been unable to control for factors such as age, years of residence in this country, domain of English use in the informants' community and individual experience. All the informants in this study were born and brought up in China, started formal English instruction in middle school, and continued studying English at the university.

Although the informants began studying English at about the age of 13, their middle school classes of 40 to 50 students typically met only two hours per week. Most of their English input came from their classes. Their English

classes were increased in senior high school to four hours a week. Some studies (Johnson and Newport, 1989) show that there is a high correlation between students' performance in English and their age of arrival in the U.S., but no significant correlation was found for subjects with classroom training in English between their performance in English and their age of when beginning English instruction. Since the informants in this study have never been to an English-speaking country and they have never been in an intensive English course, they can be classified as late learners of English.

To be sure that the informants had reached the English competency needed for this study, an English structure test from Comprehensive English Language Test (CELT) was given. As the manual points out, each section (listening, structure, and vocabulary) has enough items (75 each) to be used as an independent tool for measuring the desired trait of the test- takers. This study focuses on linguistic structures, so only the structure part of CELT was given to informants.

The second Chinese group (Chinese Group 2) was chosen because the first group was homogeneous in many ways, including their English proficiency. It is hard to determine whether language proficiency is related to the first group's sensitivity to UG principles such as Subjacency and ECP, even though the sample size is big. Studying a second

Chinese group with high proficiency in English would probably answer this question.

The second group consisted of 16 Chinese graduate students and visiting scholars currently studying at a university in the U.S. To be qualified to be a participant of this study, s/he had to be an English major or to have had intensive English classes for at least three years in universities in China or in Taiwan. S/he had to have used English continuously in reading and writing after college graduation. By the time of the study, these students had been in this country for two to five years, studying in a field requiring high English proficiency. Like the informants in the first Chinese group, informants in the second group started learning English at the age of 13 or 14 in a formal classroom setting.

The control group includes 25 native English speakers who are college students and graduate students. They have never been exposed to explicit explanations of the UG principles. Since they all have had or are having a college education, an English proficiency test was not necessary for them.

4.2 Procedure

Informants were told about this project several weeks before the test and asked to participate in a syntactical

judgment task and reading-comprehension task on a volunteer basis. They were also told that this was not a test of individual syntactical level but a test of sensitivity to universal rules. Their names were not required and they were assured the test would not affect their college grades. All the students that were so informed, volunteered, so that five intact classes were tested.

To avoid exhaustion the whole test was divided into two parts: the first part took 45 minutes since the test manual required this, and the second half had no time limit. Informants usually took about one hour for the second half.

At the beginning of the second part of the test, informants were asked to provide information about their current age, the age when they started learning English, the setting in which they learned English, and whether they knew another foreign language besides English.

As the whole project aims to test the knowledge of Subjacency and ECP, complex sentences with infinitives, and "that clauses" as objects of the modifier, are involved. Therefore, to supplement the structure test of the CELT, another judgment task and comprehension task specifically aiming at evaluating complements were added. Eight items on the judgment task and 10 on the comprehension task were selected from the Assessment of Syntactic Capabilities for the deaf. Since deaf people learn English in similar ways to

L2 learners (Berent,1988), it is appropriate for the L2 learners to use these materials.

The judgment task consists of 34 sentences. Schachter's (1989) scales of judgment have been adopted. The options "clearly grammatical," "probably grammatical," "probably ungrammatical," and "clearly ungrammatical" are used to allow the informants to have uncertainty about their judgment[10]. As a matter of fact, native speakers judge some sentences relatively better than others and the sentences are not right or wrong in an absolute sense. The informants were asked to circle one number corresponding to one of the four scales.

The last part of the test is a comprehension task, made up 20 stories with pictures. To insure that the informants were aware that two answers were possible for some of the questions, two examples were shown before the second part of the test, one allowing two answers and the other allowing only one answer. This was done to let the informants know that structural ambiguity was possible.

The second Chinese group and the native English-speaking control group were told about the study and asked if they were willing to participate. The Chinese group was asked about their majors, when and how they started learning English, and how much English they had to use after graduation. These two groups were not required to take the

CELT so study materials were handed out to them and they were informed about how to take the test by the researcher.

4.3 Materials

The judgment task of Subjacency consists of 34 sentences: 6 relate to CNPC, 6 to WH-island condition, 5 to SSC, and 5 to NP-Island condition. The remaining 12 are control sentences, 6 of which involve complex sentences in yes-no question form. This serves as another check to determine whether informants have reached the competency needed for the task. If informants do not accept these sentences as correct, the responses to the sentences involving Subjacency and ECP will be meaningless. The remaining 6 are grammatical questions involving Wh-extraction from the lower clause.

The second part is the reading comprehension task. Since this task concerns Wh-LD movement, some sentences allow Wh-word extraction from the lower clause while others do not, and psychologically, it is easier to process the gap from the upper clause. Take the following story and question for example.

"The boy looked at his calendar and found out that it was his grandmother's birthday. He had forgotten to send her a card. He decided to call her on the phone, but he didn't

know how. So he ran to ask his mother, 'Can you call Grandma with me? It's her birthday!'"

"Who did he ask -- to call -- ?"

After reading the story, a reader will attach "who" to the first gap and answer"mother" because "who" is closer to the gap in the matrix clause than that in the embedded clause. This does not necessarily mean that the reader will reject the second answer "grandma". In this case the data is very confusing, for we do not know whether the reader does not allow Wh-LD movement or he has not considered another possibility. To avoid this, another question (Is there another answer? If yes, What is it?) was asked to give the informants an opportunity to think of the possibility of the lower gap (a Wh-word moved from the embedded clause) as suggested by DeVilliers (personal communication). If a sentence does not allow Wh-extraction from the lower clause and the informant resists the temptation to give a lower clause answer, then we are sure that the informant has the knowledge of Subjacency or ECP depending on each case.

To help the informants understand the story, sentences and pictures of the story were arranged correspondingly. To avoid confusion, the second question "Is there another answer? If yes, what is it?" started on another line.

There were 20 short stories with two questions for each story in the reading-comprehension task; however, in this

paper, we are only concerned with 12 of them. The first question varied from story to story, but the second question was the same for the 12 stories to see if the lower-clause answer was acceptible. All the stories and pictures attached were used by Roeper and DeVilliers in their child language research (1988). Of the 12 questions, four have no medial Wh-words and the initial Wh-word has two gaps, see questions 1 and 2:

1. Who did he ask - to call - ?
2. When did the boy say - he hurt himself - ?

The first answer based on the story is "mother" and another one is "grandmother". Similarly, the answer to the second question is "in the evening" and the other one is "in the afternoon." These sentences are used in order to see whether the informants allow Wh-LD movement when Wh-extraction from the upper clause is also possible, even though the informants' native language does not have Wh-movement at a syntactical level.

There are eight stories with four questions starting with Wh-arguments and 4 with Wh-adjuncts, of which 4 with Wh-argument in medial and 4 Wh-adjuncts in medial. See questions 3, 4, 5, and 6.

3. Who did the boy ask -- what to bring * -- ?
4. When did the dog say -- how his bone was gone *-- ?

5. How did the mother learn -- what to bake * -- ?

6. Who did the boy ask -- how to help -- ?

4.4 Data Analysis

The main purpose of this study was to see whether the Chinese L2 learners of English are sensitive to Subjacency and ECP. Therefore:

1. Their mean score for different sentence types in the judgment task was compared with that of the native speaker group (control group).

2. Their mean scores for some sentence types (Subjacency) were compared with those of others (ECP) to see whether they treated Subjacency and ECP violations differently.

3. In order to see whether the informants' scores on English proficiency test were related to their performance in the judgment and comprehension tasks, correlation of coefficients was computed between their scores on the English proficiency test and the judgment and comprehension tasks relating to different sentence types.

CHAPTER 5

RESULTS AND DISCUSSIONS

5.1 Wh-LD Movement

In Chapter 2, we talked about Wh-movement in Chinese. It is clear that in Wh-questions Wh-words are in situ and movement is not involved at the syntax. However, it is assumed that Wh-movement takes place at LF, which would explain why Chinese L2 learners do not have problems using simple Wh-questions in English. We do not know whether they allow extraction from the embedded clause to the sentence initial COMP. Four questions of this kind based on four stories were tested on the Chinese L2 learners. Take one story mentioned in Chapter 4 for example.

"The boy looked at his calendar and found out that it was his grandmother's birthday. He had forgotten to send her a card. He decided to call her on the phone, but he didn't know how. So he ran to ask his mother.'Can you call Grandma with me? It's her birthday!'"

Who did the boy ask --- to call ---?

Is there another answer? If yes, what is it?"

Two answers are possible based on the story because either gap is properly governed by its head in light of ECP.

The first answer is "Mother" which serves as an object of "ask" and the other one is "Grandma" which is the object of "call." However, the data in Table 1 also show whether the informants have Wh-LD movement when there is no Wh-word in medial and no tense in the clause. Informants preferred "Mother" as an answer. Those informants who answered "Grandma" are considered to allow Wh-LD movement because they think "who" in this question is derived from the gap in the infinitive phrase instead of from the matrix clause which is closer to the fronting Wh-word.

When two questions are asked, the comprehension task biases towards two answers. Informants are likely to give both answers. The data I have consists of three categories: the first-gap answer "mother," in the above story; the second-gap answer "grandma," and both answers, "mother" and "grandma." This leads to the inflation of figures when first-gap answers are compared with the second-gap ones. In other words, the number of responses to the first and second gaps will be big, for the number of responses in the third category mentioned above has to add to the first and second categories, respectively.

Do adult Chinese L2 learners allow Wh-LD movement? The results of the study follows[11].

Table 1: Long-Distance Interpretation of English Questions

Participants: 180 Chinese students (C)
25 native English speaking students (N)

a. __a__ = trace in the matric clause
b. __b__ = trace in the embedded clause
c. ____/ = __a__ and __b__

*. The figure below a,b, and c refers to the % of the responses and the No. of informants for each trace respectively.

2. Who did he ask __a__ to call __b__ ?

C.	34%(61)	52%(93)	13%(24)
N.	0%	68%(17)	32%(8)

5. Who did the girl ask __a__ to help __b__ ?

C.	37%(67)	49%(88)	12%(21)
N.	4%(1)	60%(15)	32%(8)

9. When did the boy say __a__ he hurt himself __b__ ?

C.	42%(76)	45%(81)	9%(16)
N.	12%(3)	68%(17)	12%(3)

14. How did the policeman say __a__ the man had stolen the purse __b__?

C.	42%(75)	45%(81)	8%(16)
N.	12%(3)	68%(17)	12%(13)

The percentages refer to the percent of the whole group and the number refers to the actual number of informants giving answers to that gap. The percent and numbers in the middle column mean that two answers are allowed with one to the first gap and one to the second, that is, "Mother" for the first gap and "Grandma" for the second gap. For the first story, 34% of 180, or 61 informants, said "Mother"; 52% of 180, or 93 informants, said that the first answer is "Mother" and the second one is "Grandma"; 13% of 180, or 24 said "Grandma."

About 64% of the native English speakers gave both the first and second answers to the four questions and the percentage of this group permitting Wh-LD movement is greater.

Although the Chinese L2 learners are not as sophisticated as the native speakers in their knowledge of English, almost 60% of the Chinese students allow answers to the gap in the embedded clause across the four questions. Out of 180 Chinese students, only 9 informants do not allow any Wh-LD movement across 20 stories tested, and strangely, they involve some who have high scores on the English proficiency test.

5.2 Adult L2 Learners vs. Natives on Subjacency

As mentioned in Chapter 3, several studies (White 1988; Felix 1988; Schachter 1988 and others) have been done to test the sensitivity in adult L2 learners to Subjacency. Of them, studies on L2 learners whose L1 does not observe Subjacency in Wh-questions have aroused great interest. It is generally assumed that L2 learning is a process in which learners transfer their L1 knowledge into L2 language, if possible, and a process in which learners learn language-particular rules either through instruction or through input in their interactions with the environment. If the L2 learners' L1 does not obey Subjacency and there has been no

instruction given on Subjacency, L2 learners are likely to fail to reject Subjacency violation cases. However, Subjacency is considered a UG principle which is not learned but realized with the language input once a certain language proficiency is reached. If the language acquisition device (LAD) is still fully operating in adults, they should show constraints on extractions from the island conditions mentioned above. Table 1 indicates that the informants in this study allowed Wh-LD movement in English, but does not show whether they have limitations on Wh-LD movement.

5.2.1 Subjacency and Chance

Twenty sentences with Subjacency violations were tested on L2 learners: five sentences were involved in CNPC; five in SSC; five in Wh-island condition; and five in NP-island condition. The L2 learners rejected a high percentage of the Subjacency violations: for CNPC and SSC they rejected almost 70% of them. The native English speakers rejected about 90% of all the violations except for the NP-Island condition. Look at table 2[12]:

Table 2 Sensitivity to Subjacency Violations

Participants: 180 Chinese students (C)
25 native English-speaking students (N)

CNPC: What did that man buy $_{np}$[a hat $_{s}$[that matches -- in our stores]]?
C. 71.6% N. 92.8%

SSC: What would $_{s}$[for your daughter to give up --]be a pity?
C. 70.12% N. 90.4%

Wh-Island: What might your friend ask $_{s}$[where I hid -- last month]?
C. 52.14% N. 89.33%

NP-Island:What are you interested in $_{np}$[his articles on --]?
C: 61.1% N. 76.22%

Table 2 indicates the percentage of the total number of the group who rejected different types of Subjacency violations and is the average percentage rate of rejection of each island condition.

When a t-test was conducted for each structure type, a significant difference between the L2 group and native group was found[13] (for each sentence, the mean score for the Chinese students was .6545 and the mean score for the native English-speaking students was .8818; at .05 level). Even so, it is unwise to conclude that the adult L2 learners were not sensitive to Subjacency, and that the UG was not available to them. We cannot overlook the fact that 70% of the 180 adult L2 learners, that is 126 informants, rejected the Subjacency violations, the same result as in the study by Bley-Vroman et al. However, the number of informants was

twice as high as in that study. To rule out the possibility that L2 learners performed the task randomly, a one sample test was performed and the result indicates that the L2 learners performed the judgment task on Subjacency above chance-level. In other words, they are sensitive to the movement constraints but they do not do as well as the native speakers. A similar finding in Bley-Vroman's study has led to the conclusion that the UG mechanism is partially operative in adult L2 learners. Johnson also found that her subjects performed above chance on Subjacency as a whole, but not as well as the native speakers and younger Chinese L2 learners (Johnson 1988, p.46). She concludes that the adult Chinese L2 learners' sensitivity to UG principles is affected over maturation.

Unlike subjects in the studies by Johnson and Bley-Vroman et al, the 180 Chinese university students in this study had never been immersed in an English-speaking environment. All the English training was given in formal classroom instruction and none of them majored in English. Still they performed on the Subjacency task above chance level which indicates that they had access to Subjacency.

5.2.2 Subjacency, Control and English Proficiency

Is the grammaticality score related to the L2 learners' English proficiency level? First of all, the L2 learners

must have had a knowledge of complex sentences, including relative, noun clause, infinitive phrase, and Wh-questions, before they were able to participate in the task; otherwise, the test results would be meaningless.

In the judgment task, control sentences consisted of yes-no questions and Wh-questions, both involving complicated sentences. If L2 learners did not allow yes-no questions, it meant they were not ready for the task. The grammatical Wh-questions in the test aimed to rule out the possibility that learners would reject all the Wh-questions indiscriminately and we do not know whether they showed constraints on movement or whether they simply did not allow any Wh-LD movement. The result is shown in Figure 5.1[14] and Table 3:

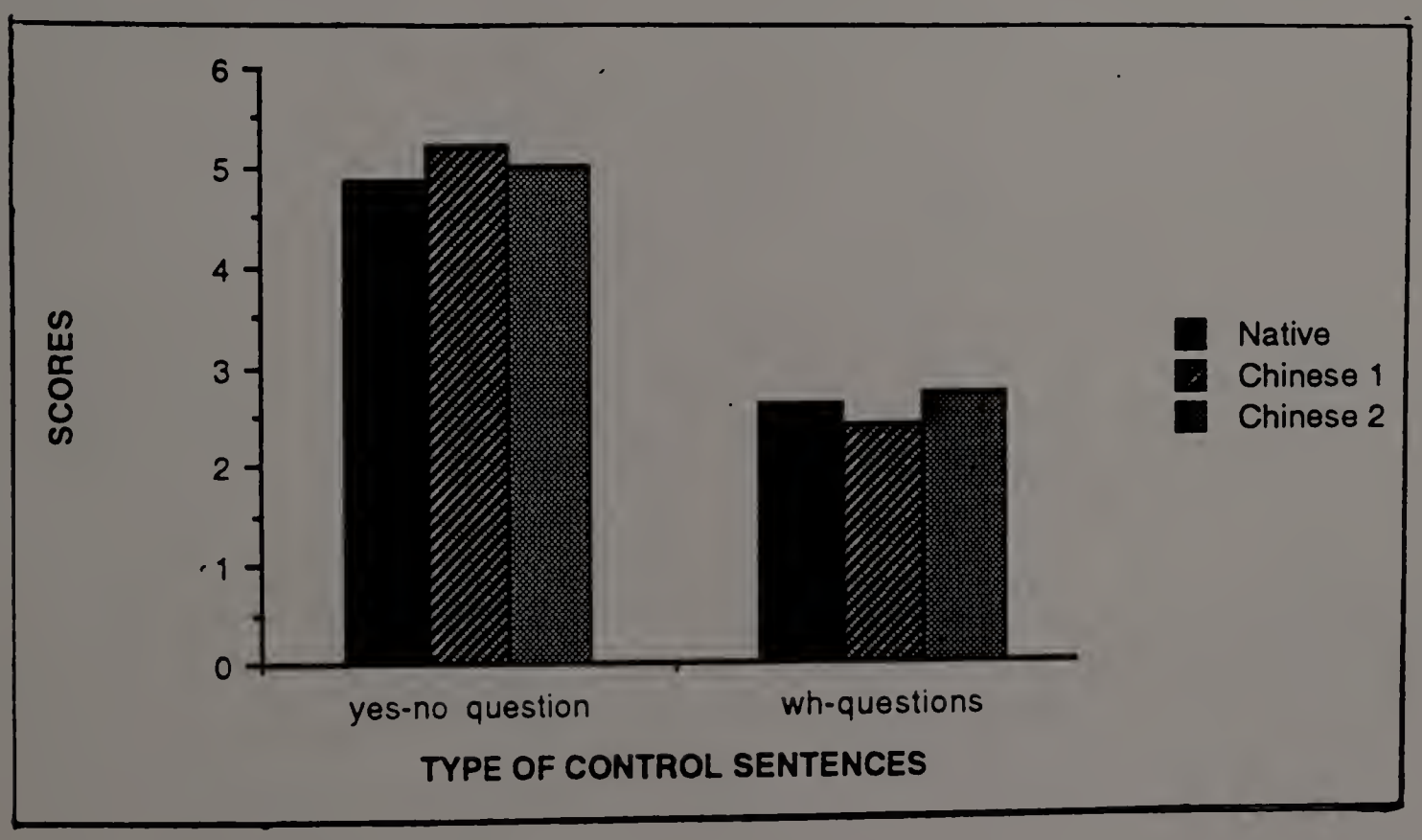


Figure 5.1 Scores on Control Sentences

Table 3: Acceptance of Control Sentences

a. Does Jim believe the story Mary told to her friends?
C. 82.87% N. 81.33%

b. Which movie did you guess that they went to last night?
C. 67.13% N. 65%

The t-test shows no difference between Chinese Group 1 and the native English speakers (mean scores for the former group was .7678 and for the latter group, it was .7440.) This indicates that Chinese Group 1 was ready for the task and they would be expected to show sensitivity to Subjacency violations. Table 2 demonstrates that they showed constraints on movement but they were not as sensitive as the native speakers. How shall we explain the discrepancy? Probably, after the L2 learners had reached a certain English proficiency level showing readiness for the task, language proficiency was still a factor affecting the judgment scores. A standardized test (CELT) plus some items relating relative clauses from the assessment of Syntactic Capabilities was completed by Chinese Group 1. Although scores varied, they all obtained a score over 60 based on the conversion table for determining test scores expressed in percentages. Then a correlation was performed to see whether their English proficiency score correlated with their grammaticality score on Subjacency. See Table 4.

Table 4: Correlation between English Proficiency and Subjacency Test Scores by Chinese Students

	CNPC	SSC	Wh-Island	NP-Island
Test	.0528	.0692	.1518	.1456

1-tailed at .01 level[15]

This table only shows that for this L2 group, English proficiency was not correlated with the grammaticality score. An arbitrary division of advanced, intermediate and beginning groups (according to their CELT test scores) was also made and a one-way anova test was calculated to see whether there would be any group difference. Again, the difference was not significant. The 180 learners were from five intact classes: two advanced English classes of sophomores, one intermediate class of sophomores, and one advanced and one intermediate classes of freshmen. The learners were assumed to be at different levels. It seems that these 180 learners were more or less at the same level as far as their English proficiency is concerned.

We already know that there was no difference between the Chinese group and the native English speakers in their responses to the control sentences but there was a difference in respect to Subjacency violations. To make sure the Chinese group treated subjacency violations and the

control sentences differently, a paired t-test was calculated:

Table 5: Response of Chinese Group 1 to Subjacency Violations and Controls

Variable	No. of Cases	Mean	SD	2-tail Prob.
Subjacency	180	.6545	.17	.000
control	180	.7678	.185	

This table shows that the Chinese students did better on the control sentences than on Subjacency violations, which conflicts with Felix's study (1988) and Bley-Vroman et al.'s. In those two studies, subjects rejected the ungrammatical sentences more accurately than they accepted the grammatical ones. Several reasons can account for this difference. First, parallel structures for both grammatical and ungrammatical sentences could be found in Felix's study because other UG principles such as that-trace-effect was tested, e.g., *"Who does John believe that - saw him?" vs. "Who does John believe that he saw - ?". In this study, most of the control sentences are object complement clauses to match the ungrammatical relative and noun-complement clauses. It is easier to identify the object complement than the Subjacency violations in relative and noun-complement clauses. Second, the ungrammaticality of some sentences is

very salient. Take coordination structures in Bley-Vroman et al's study (p.19) for example. *"What did John find the ball and - ?" Finally, some control sentences in Bley-Vroman et al's study are much longer than Subjacency violation sentences. All this contributes to the relatively lower scores on the control sentences than on Subjacency violations, in their studies.

From the discussion in Chapter 2, we know that rules concerning the formation of relative clauses are late-learned rules. The Chinese learners being reported on above did not do well as the native English speakers. Probably the Chinese learners' knowledge of English was not sophisticated enough to perform the task as well as the native speakers were able to do. A supplementary study was conducted to find this out.

5.2.3 Chinese Group 2 vs. Native English Speakers

The Chinese Group 1 was too uniform in ability to test this property, a supplementary study was conducted. Sixteen Chinese graduate students and scholars with a high degree of English proficiency (Chinese Group 2) participated in the Judgment task. A t-test between these Chinese Group 2 and native groups was calculated and the result is given in Figure 5.2 and Table 6:

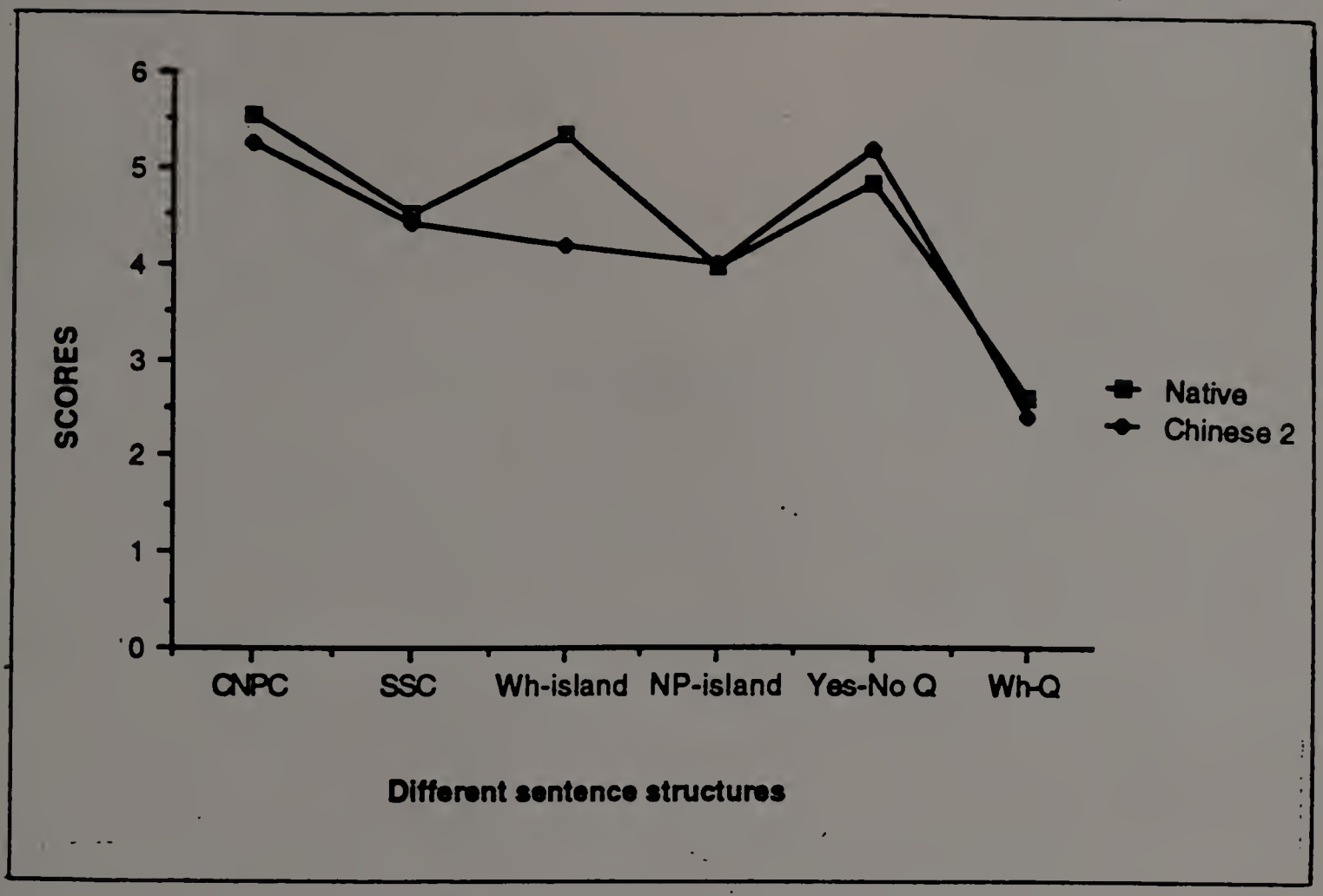


Figure 5.2 Scores on the Judgment Task

Table 6: Comparison of Chinese Group 2 and English Speakers on Judgment Tasks

Participants: 16 Chinese informants
25 native English speakers

		CNPC	SSC	WH-ISLAND	NP-ISLAND	CONTROL 1	CONTROL 2
Mean	Ch.	5.27	4.40	4.20	4.00	5.2	2.4
	N.	5.56	4.52	5.36	3.96	4.84	2.6
F-Prob.		.4343	.6807	.0058	.9146	.2354	.6218

F Prob. is the result of one-way Anova

The table shows there is no significant difference between these two groups on different types of Subjacency violation sentences, except on the Wh-island condition. The Wh-island condition will be discussed below. As for Subjacency, previous studies show that Dutch, German, and Spanish learners of English can do as well as native English speakers on the task, which is attributed to their L1 transfer, for these languages have Wh-movement in syntax, thereby observing Subjacency. These languages and English only differ in bounding nodes. However, the Chinese speakers' L1 does not obey Subjacency and they cannot obtain it from input. Where does their knowledge of Subjacency come from? Since Subjacency is assumed to be universal, L2 learners do not have to learn it, even if their L1 does not observe it.

Moreover, since the L2 learners were adults and their scores on rejecting Subjacency were not significantly different from those of the native English speakers, the results can be used to argue against the claim made by Johnson (1988), "Subjacency is affected by maturation." The informants in both groups started learning English late, at the age of 14 or 15, the informants in the supplementary study were much older than the informants in the major study. I do not think age, here, was a main factor causing the difference in Subjacency task performance. Rather it was

the real time they devoted to learning English. It is not maturation but language proficiency that counts.

Language proficiency seems more than any measurements available can find out. It is related to one's intuition of a language. When a child speaks, he gradually develops his intuition of his native language, i.e. his ability to judge whether what someone says makes sense or is acceptable. No one will doubt one's intuition about his native language.

Does someone possess the intuition of another language when he learns that language as an adult? Intuition is not taught but is developed in the process of one's language learning. It might have different levels, correlating to one's language level. Children who do not know complicated structures do not have the ability to judge sentences involving complicated structures.

It is difficult to measure the sophistication level of one's language level. It is more than the structures that a test can find out. In this study reported here, the 180 informants in Chinese Group 1 had no problem judging and comprehending noun complement and relative clauses in the proficiency test. However, they did not do as well as Chinese Group 2 and the control group in the Subjacency task. It seems that language proficiency is the integrated comprehensive knowledge of that language.

5.2.4 Did the Chinese Students Treat CNPC, SSC, Wh-island, and NP-island Conditions in the Same Way?

Subjacency consists of several island conditions but in this study we mainly tested CNPC, SSC, WH-island, and NP-island conditions. These island conditions share the same property--the element extracted has moved more than one bounding node, therefore violating Subjacency. However, violation of Subjacency in one case may be worse than that in another case, the assumption is for the sentence with a moved element crossing three bounding nodes is more unacceptable than one with the moved element crossing two bounding nodes. Take CNPC and NP-island conditions for example. Violations of CNPC involve moving across three bounding nodes while violations of NP-island conditions involve moving across two bounding nodes. Compare sentences 1 and 2.

1. [S' What did [S1 the police arrest [NP the man [S' [S2 who was carrying -]]]] ?

2. [S'What are [S you presently interested in [NP his article on -]]] ?

In sentence 1 WHAT has to move across bounding nodes S2, NP, and S1 to the sentence initial position, while in sentence 2, WHAT has crossed NP and S to front the sentence.

In the previous section, we found that the 180 Chinese L2 learners were sensitive to Subjacency but we do not know whether they treated island conditions differently. If they had constraints on movement, they would have shown different degrees of sensitivity toward different island conditions. Paired t-tests are performed and the result is listed in Table 7:

Table 7: Paired t-tests of Different Island Conditions by Chinese L2 Learners

Type	No. of cases	Mean	SD	2-tail Prob.
CNPC	180	.7178	.252	.165
SSC	180	.7011	.217	
CNPC	180	.7278	.252	.000
Wh-island	180	.5778	.244	
SSC	180	.7011	.217	.000
Wh-island	180	.5778	.244	
SSC	180	.7011	.217	.000
NP-island	180	.6111	.243	
Wh-island	180	.5778	.244	.128
NP-island	180	.6111	.243	
CNPC	180	.7178	.252	.000
NP-island	180	.6111	.243	

Table 7 indicates that the informants treated different island conditions differently[16], and they perceived that the number of bounding nodes a moved element crossed affects the grammaticality of a sentence. In the structure of CNPC, extraction of an element in the embedded clause involves

crossing three bounding nodes as in 1. However, in Wh-island and NP-island structures, extraction of an element from these islands involves only two bounding nodes, which is not as a strong violation of Subjacency as in that of CNPC. Besides, the informants perceived that a sentence violating two movement constraints is worse than that violating one movement constraints. Although a moved element in SSC crosses two bounding nodes (violation of Subjacency), the informants' score on rejecting SSC is much higher than that on rejecting Wh-island conditions, for sentences like 3 violate not only Subjacency but also SSC.

3. What would for your daughter to give up -- be a pity?

The native English speaking group was not as sensitive as the L2 group. They treated the NP-island condition differently from CNPC, SSC, and Wh-island condition. See Table 8.

Table 8: <u>English Speakers' Treatment of Different Island Conditions</u>

Paired t-test	CNPC / SSC	CNPC / WH	CNPC \ NP	SSC / WH	SSC \ NP	WH / NP
2-tail Prob.	.374	.170	.001	.650	.001	.005

Originally it is assumed that there might be a difference in the native English speakers' treatment of an S node and an NP node, although they are both are bounding

nodes. When an element moves across an NP node, it crosses a phrase, but when an element moves across an S node, it crosses a sentence. An S node might be more of a constraint than an NP node. Roeper (personal communication) points out some NP-islands can be very constraining and extraction of an element out of the island is completely unacceptable, e.g. "What did you buy a loaf of -- ?"

A preposition that usually modifies a noun can be either a complement or an adjunct as Radford suggested (1988, P.167-216). Complements have a closer relationship than adjuncts with their heads -- nouns. Thereby, extraction of complements is acceptable while extraction of adjuncts is not. Take one sentence from the present study for example. "Which movie have you forgotten the famous director of -- ? Although the above sentence violates Subjacency, 52% of the 180 Chinese informants and 56% of the native English speakers accept this sentence. The Wh-phrase "which movie" originates from the gap after "of" and the prepositional phrase "of which movie" is a complement of "director". Extracting an element out from a complement is possible because it is easy to associate the wh-word or phrase with the gap (detail discussion about adjuncts and complements of a NP, see Radford, 1988).

5.2.5 Relative Clause and Noun-complement Clause

5.2.5.1 Introduction

Several studies in L2 acquisition were done to test L2 languages learners' sensitivity to Subjacency. When violations of Subjacency were broken down, CNPC was found to be a very strong constraint. No previous study noticed the difference between the two types of structures (relative clause and noun complement clause) in L2 learners' performance until recently.

Informants in Chinese Group 1 of the current study rejected about 70% of the cases violating CNPC, but within the five sentences violating CNPC, we found that the informants rejected sentences involving relative clauses more frequently than those with noun clauses. So CNPC violations were broken up into relative clauses and noun clauses and a paired t-test was calculated to see whether the difference was significant. The result in Figure 3 demonstrates that Chinese Group 1 treated Subjacency in relative and noun-complement clauses in a different way.

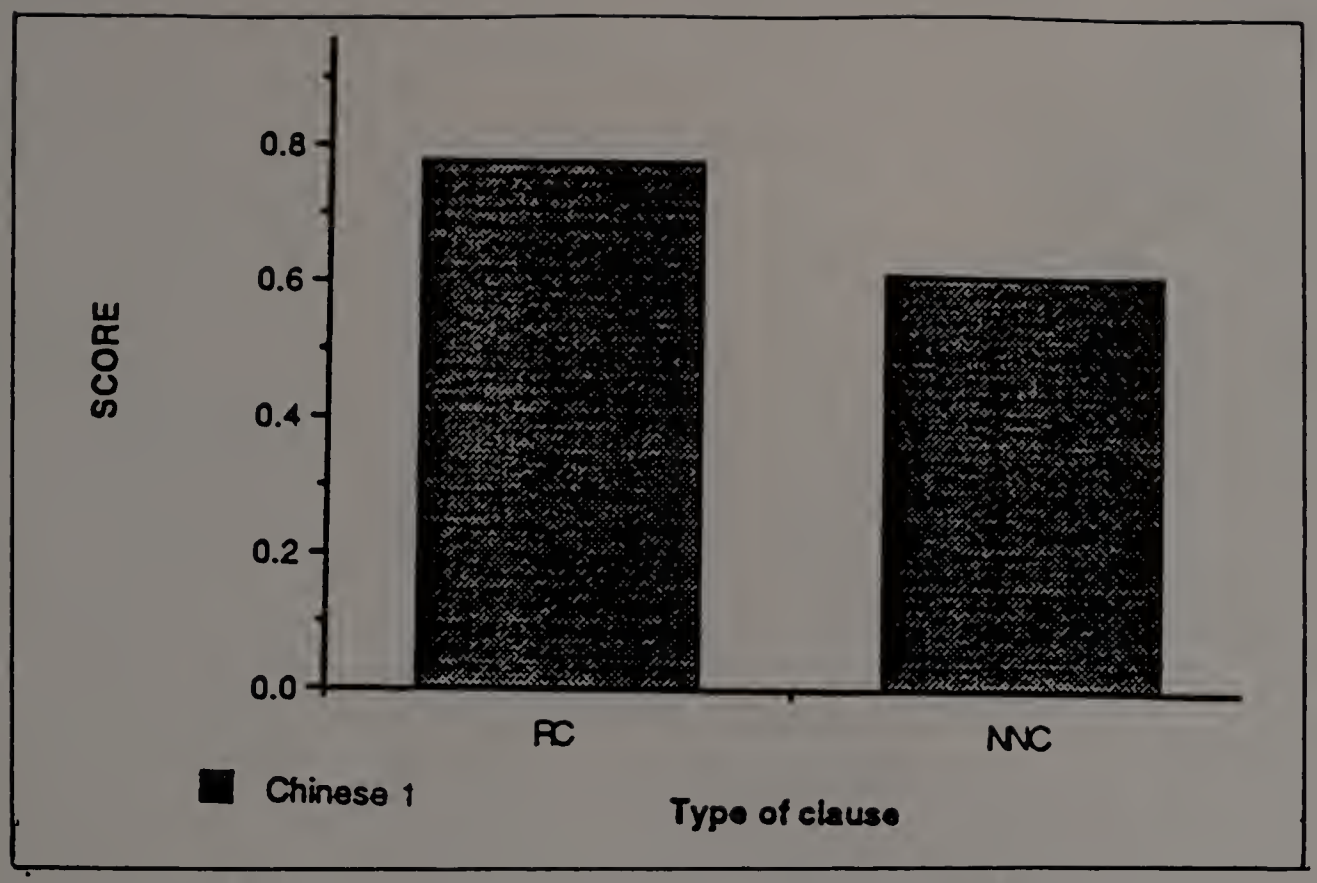


Figure 5.3 Subjacency in Relative and Noun Complement Clauses

In terms of bounding nodes, any element extracted out from a RC and noun-complement clause involves the same number and the same bounding nodes as Radford points out (p.218) that they involve "a constraint against moving any element X out of the bracketed clause in structures of the type:

[NP ... N - [S'...X ...]...]"

(p.218)

Radford also listed the syntactic difference between an RC and noun-complement clause, but here we focus on the difference in deep structure in order to account for the difference in the Subjacency test. Understanding the difference might have implications for L2 acquisition.

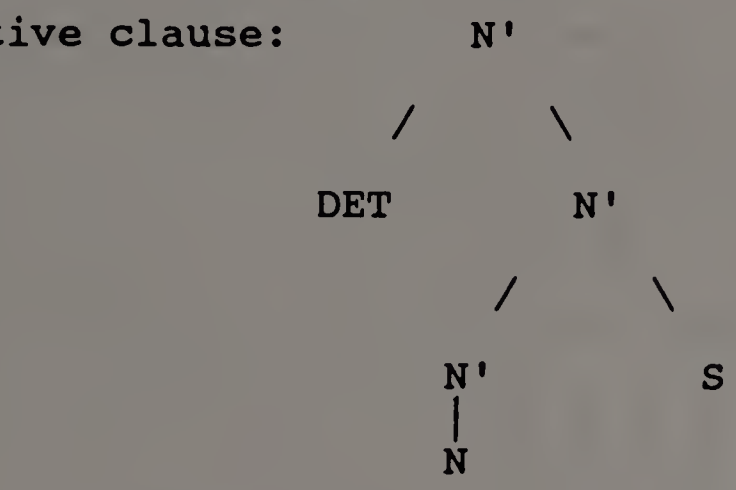
"Relative clauses can be used to modify any head noun, whereas noun-complement clauses are only found after a restricted set of head nouns:

3. the car that you bought (relative clause)

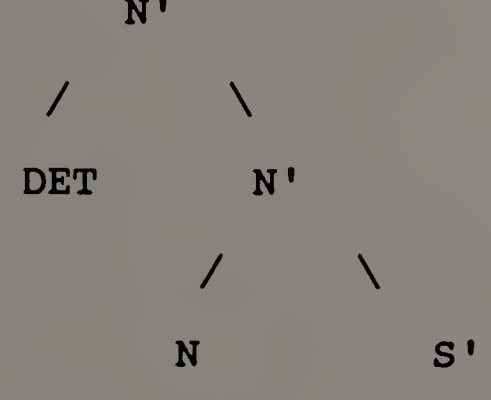
* the car that the world is round (noun-complement clause)

RC and noun clauses have different d-structures:

relative clause:



noun-complement clause:



In the relative clause, the clause S' is the sister of N' while in the noun clause the complement S' is a sister of N. Constituents are generally subcategorised with respect to the range of sister constituents they permit (ibid, p.216-217).

In other words, a relative clause can modify any head noun and no syntactic limitation is concerned. But noun clauses involve subcategorisation rules for the head noun, the acquisition of which requires learners to know language-particular rules, although RC and noun clause structures share almost similar structures.

5.2.5.2 The Difficulty Level of RCs and NCCs

Why do 180 Chinese learners of English reject more Subjacency violations in RCs than in NCCs? One possible interpretation might be the difficulty levels of these two structures. Judgement task is based on the informants' intuition to process the written inputs. It is easier for the L2 informants to process NNCs than RCs owing to the different properties of these two structures. When they hear or read nouns like FACT or STORY in a NNC, they expect a clause to get more information about the STORY. In other words, the limited set of nouns that subcategorized for a clause prepare the reader what to expect next. This is not the case for a RC. Even for a similar pair of a RC and a NNC, processing a RC needs more knowledge than a NNC. Consider the following a and b.

a. They all knew the story that John stole a car.

b. They all knew the story what John told us.

In terms of transformations, RCs need one more

transformation than NNCs, that is, relative pronoun substitution or Wh-word fronting in the embedded clause. This step is need in sentence b to link the main sentence with the clause.

As for extraction, when something is extracted out of a RC, it is hard to process the sentence because to associate the wh-word with the gap is difficult. This is due to the distance from the gap to the wh-word and there is no landing-side on the way. Readers can not make sense of the sentence and the process is blocked, thus rejecting the sentence. This is not the same with NNCs. Informants found it easier to link the wh-word with the gap in NNCs, because the gap is some way related to the verb in the main sentence and readers can make sense out of the sentence. So they accept the sentence although theoretically, the sentence violates Subjacency. The same is true with NP-island conditions. Both the control group and the Chinese group reject less Subjacency violation in NP-islands than in other conditions such as SSC.

Based on these facts, we can suggest that when informants reject more Subjacency violations on a certain type of structures, it might indicate that the type of structures is more difficult than other types. The current study has found that Subjacency violations in CNPCs and SSCs are less acceptable than that in Wh-island and NP-island

conditions. Therefore, we can assume that sentences of the later types are easier to learn that the former type.

One may argue that extraction out of an adjunct clause is very bad and whether that means that adjunct clauses are difficult to learn. We know that children use adjunct clauses very early and the same is true for the L2 learners.

Actually the relation between a main sentence and an adjunct clauses is not close and they are connected by a conjunction such as WHEN, BEFORE, AFTER or BECAUSE. The Wh-words in RCs are different because they not only function as a link to combine the clause with the main sentence but also play a grammatical part in the clause. Therefore, the relation between the clause and the main sentence in RCs is closer than in the adjunct clauses. That is why extraction out from the adjunct is worse than that from a RC.

If we look at the tree diagram, we see the adjunct clause is attached high to the main clause which suggests that it is easier to acquire than those attached lower in the tree.

Also participating in this study were a control group which consists of 25 native English speakers and Chinese group 2 that is made up of 16 advanced English learners. These two groups are supposed to treat Subjacency violations in RCs and NCCs the same way for the English proficiency

problem is not involved. The result of their judgment task support this assumption.

In terms of acquisition, we will assume that the relative clause is more difficult than the noun complement clause if everything else is equal. This might explain why informants in this study were more likely to allow extraction out of noun complement clauses than that of relative clauses.

5.2.5.3 Relationship with Their Heads

Although RCs and NCCs look similar at a surface level, that is, a clause is used as a noun modifier, the relationship between the head noun and the clause modifier in RCs and NCCs is different. In NCCs, the clause is an apposition to its head noun. It expands and makes more explicit what the head noun is referring to[17], since NCCs function as an apposition of the head noun which has a close relationship with its verb. However, the clause in RCs modify the noun in such a way as to limit the meaning of the noun.

In the tree diagram above, RC is a sister to N-bar while NC is a sister to N-node. Due to these differences, Radford (1988:218) suggests that the two types of clause have different structural properties, in that NCCs are arguments and RCs are adjuncts. NCC is not only close to its

head because the head subcategorized for its sister branch but also close to the verb in the matrix sentence, because NCC is an apposition to its head. We can assume that NCC is in a certain way governed by the main verb. When an element in the NCC is extracted, its trace is somewhat governed by the main verb.

Unlike NCCs, RCs are in no way governed by the matrix verb. Therefore, any element extracted out from a RC leaves an ungoverned trace. Compare the following sentences.

1. What did that man buy a hat that matches -- in our store?
2. What does John believe the story that Mary saw __ last night?

155 out of 180 (86.1%) Chinese L2 learners consider (1) ungrammatical but 104 out of 180 (57.8%) regard (2) as ungrammatical. They treat the two types of clause statistically differently which might explain the linguistic difference in them. In (2), the NCC is a complement of its head noun "story" which might not be a strong barrier for the movement of an element in the NCC. But in (1), the RC is an adjunct of its head "hat". Radford suggests that subjects and adjuncts are islands and complements are not (1988:487).

The fact that complements do not constitute islands is probably attributed to their relationship to their heads. When the head is a verb, the complement is lexically

governed; when the head is a noun, the complement may be governed through its head by the governor of its head. As for adjuncts, they have relationships with the clause.

5.2.5.4 A Derivational Model

In discussion about Condition C effects, Lebeaux (1990) has found that RCs and NCCs are different.

1. Which picture that $John_i$ took did he_i like?
*2. Whose claim that $John_i$ likes Mary did he_i deny?

In 2, "deny" subcategorized for the internal argument "claim" which takes the clause as a complement. He assumes that the whole structure is present at DS, by projection principle. The whole structure is ungrammatical because it violates Condition C -- the name "John" is C-commanded by a co-indexed pronoun.

As for 1, if the whole structure is also present at DS, it is also ungrammatical for the same reason as in sentence 2. However, sentence 1 is grammatical. Lebeaux assumes that instead of the full structure of sentence 1 that is present at DS, only the matrix sentence John likes which pictures is present. The adjunct -- the RC-- is attached to the sentence after the Wh-phrase moves to the sentence initial position. Therefore, Condition C effects

are abrogated and the coreference between the name and its c-commanding pronoun is possible.

In light of the same proposal, the full structure of NCCs is present at DS as well as SS, the gap in the complement is assumed to be governed through its head noun by the verb in the matrix clause. Therefore, extraction from the complement is possible. As for RCs which are categorized as adjuncts, they are assumed to be present at some point of the derivation process, instead of at DS. So an adjunct attaches to the matrix clause as a unit and nothing can be extracted out from it.

The above mentioned three interpretations all seem plausible and further study is needed to discover the nature of the difference between RCs and NNCs. For instance, in either child language acquisition or L2 acquisition, we can look at their acquisition of RCs and NNCs and see which takes place first.

5.3 Sensitivity to the ECP

No study has reported on L2 learners' sensitivity to the ECP, although some studies such as Bley-Vroman et al's have included sentences violating the ECP. The ECP is another assumed set of universal principles, but unlike Subjacencey, which applies to movement at syntactical level,

the ECP applies at both s-structure and LF level. In the present study, all test sentences violating the ECP are also involved in Subjacency violations, specifically violating Wh-island conditions. So it is not surprising to find the native English speakers and the two Chinese groups rejecting these sentences because they violate Subjacency. But the Wh-island condition is not as constraining as CNPC and SSC, particularly when a Wh-argument goes over a medial Wh-adjunct in the COMP (Rizzi, 1990).

However, no differences among Wh-island conditions have been shown in previous studies in which grammaticality judgment tasks were used, but tests of sensitivity to the ECP in comprehension tasks were not tried. A well-controlled comprehension test might better show the intuition of the informants on the grammaticality of sentences. In this study both judgment and comprehension tasks were used to test L2 learner's sensitivity to the ECP. In the judgment task, L2 learners showed their sensitivity to the ECP while the native speakers consistently rejected violations of the Wh-island condition as they did other violations of Subjacency (this is shown in Table 7 and 8.)

In the judgment task, all sentences involving the Wh-island condition are of the same type, with the Wh-argument at the initial position and the Wh-adjunct in the medial COMP position such as the following sentence -- What did he say how Mary was looking for yesterday?

Theoretically, the gap is lexically governed by the verb phrase look for so the ECP is obeyed. Subjacency is not as much of a constraint as the ECP, so it is not totally unacceptable. L2 learners treated Wh-island conditions on one side and CNPC and SSC on the other differently. They rejected Wh-island violation cases less often than they rejected other Subjacency violations, and the difference is significant. But the native speakers did not distinguish between Wh-island conditions and CNPC and SSC, which is probably due to the Subjacency violation involved in these sentences. However, in the comprehension task in which rich context is provided, native speakers accepted the Wh-argument moving over the Wh-adjunct to the sentence initial position. They reasoned that Wh-adjunct islands do not block the movement of a Wh-argument.

Table 9: Long-Distance Interpretation of Wh-argument over Wh-adjunct

Participants: 180 Chinese students
25 natives English speakers

a. __a__ = trace in the main clause
b. __b__ = trace in the embedded clause
c. ___/ = __a__ and __b__
*. The figure below a,b, and c refers to the % of the responses and the # of informants to the trace respectively.

1. Who did the boy ask __a__ how to help __b__ ?			
	C.	47%(84)	50%(90)	1.7%(3)
	N.	68%(17)	24%(6)	8% (2)
10. Who did the girl show __a__ how to paint __b__ ?			
	C.	57%(103)	38%(68)	1.7%(3)
	N.	44%(11)	44%(11)	8% (2)

5.3.1 Wh-island Conditions

The Wh-island condition involves several other types of sentences apart from sentence 4.

5. [S' When did [S John know [S'how [S Pro[to fix his bike t]]]?
6. [S' How did [S the mother know [S'what [S Pro [to bake t]]]?
7. [S' Who did [S the girl ask [S'what [S Pro [to throw t]]]?

In sentence 5 we have a Wh-adjunct going over a Wh-adjunct; in sentence 6, a Wh-adjunct going over a Wh-argument; in sentence 7, a Wh-argument going over a Wh-argument. The Chinese learners treated type 4 differently

from other Subjacency violations in both judgment and comprehension tasks. Native speakers distinguished a Wh-island condition from other Subjacency violations only when the context was provided. Is the difference due to informants being able to pick up cues in the story irrespective of syntactic structures of the question? The responses to sentences of 5, 6, and 7 type denied this possibility. Look at Figure 5.4 and Table 10:

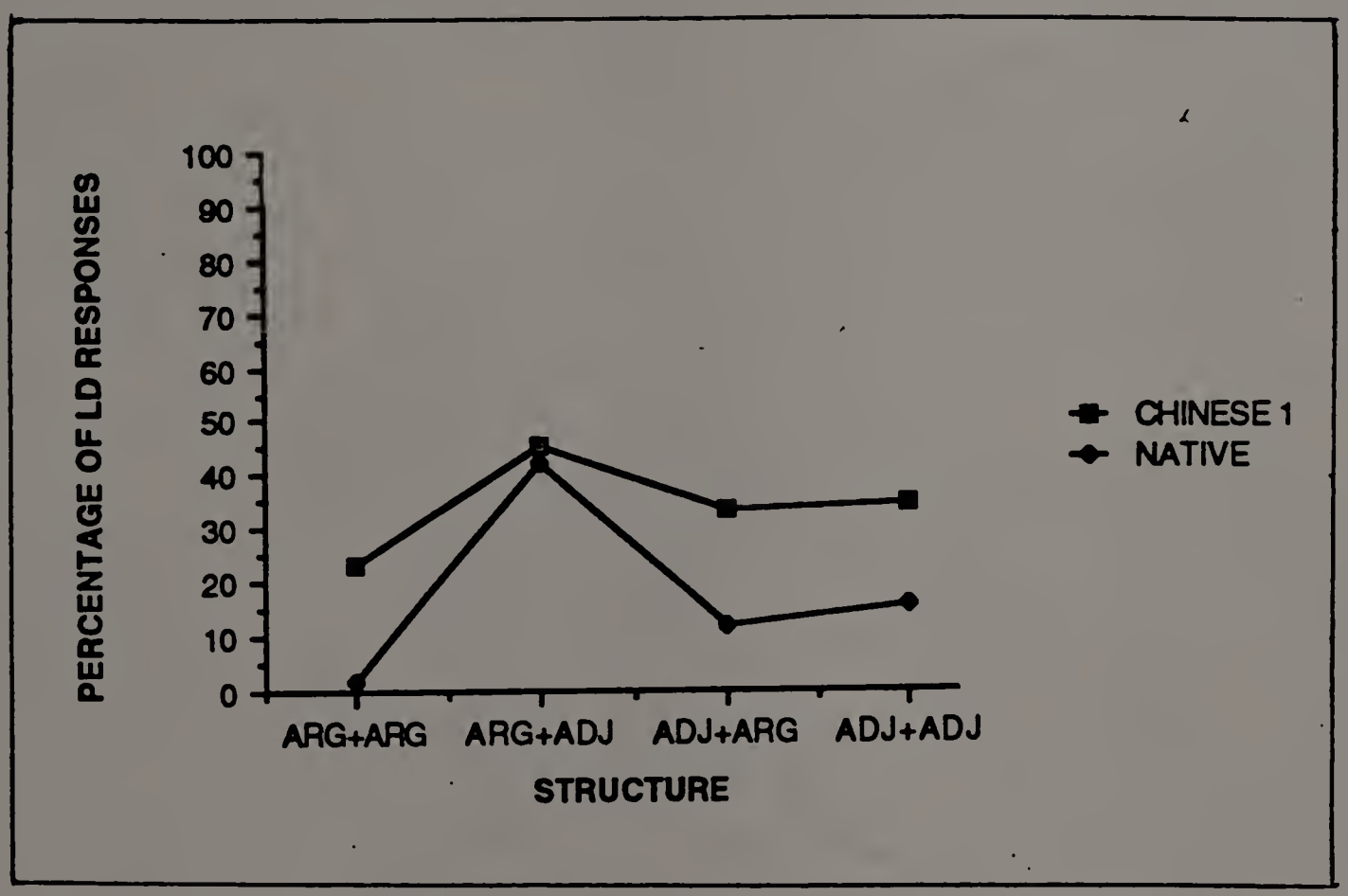


Figure 5.4 Long Distance Interpretation

Table 10: Different Types of Wh-islands

Participants: 180 Chinese students (C)
25 native English speakers (N)

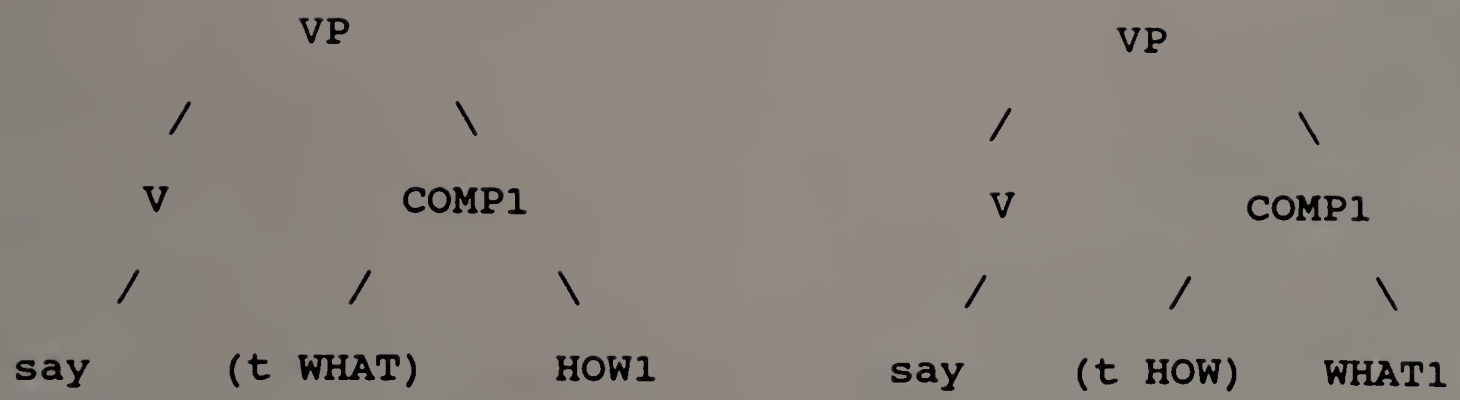
a. __a__ = trace in the main clause
b. __b__ = trace in the embedded clause
c. ___/ = __a__ and __b__
*. The figure below a,b, and c refers to the % of the responses and the # of informants to the trace respectively.

	Argument		Argument medial
3. Who did the boy ask __a__	what to bring		__b__?
C.	77%(138)	20%(36)	.6%(1)
N.	96%(24)	0%	0%
7. Who did the girl ask __a__	what to throw		__b__?
C.	69%(125)	25%(45)	1.7%(3)
N.	92%(23)	4% (1)	0%
	Adjunct		Adjunct medial
13. When did the dog say __a__	how his bone was gone		__b__?
C.	56%(101)	31%(62)	3.4%(6)
N.	84%(21)	8%(2)	4% (1)
18. When did John know __a__	how to fix his bike		__b__?
C.	63%(113)	26%(46)	8.3%(15)
N.	72%(18)	20%(5)	0%
	Adjunct		Argument medial
17. How did Rover learn __a__	what to catch		__b__?
C.	43%(77)	22%(39)	24%(43)
N.	80%(20)	16%(4)	0%
20. How did the mother learn __a__	what to bake		__b__?
C.	74%(134)	21%(37)	.6%(1)
N.	84%(21)	8%(2)	0%

In terms of Subjacency, which is a rule for syntactic movement, sentences 4-7 in the text all violate it and they are equally ungrammatical. But in terms of ECP which is a rule for government, sentence 4 on the one side and sentences 5 and 6 on the other are very different.

Both natives and L2 learners in this study distinguish sentence type 4 from sentence types 5-7 and they allow more answers to the gaps in the embedded clause in 4 than clauses in 5-7. When the total number of answers to the embedded clause in 4 is compared with that the clauses in 5-7 respectively, the difference is significant at .05. This is true for both native and Chinese groups. This demonstrates that both groups are sensitive to the ECP in the comprehension task.

The ungrammaticality in sentences 5 and 6 lies in the failure of proper government of the trace t because in each case t is not lexically governed by its head verb and the filled COMP for the embedded clause blocks antecedent government between the initial Wh-word and its trace t. When a Wh-adjunct moves to the matrix COMP position, it has to adjoin the medial COMP which another Wh-word occupies. The moved Wh-adjunct trace is not in a c-commanding position, hence it fails to govern its trace in the lower clause. In similar cases, a Wh-argument trace is lexically governed. See the following structure:



(from deVilliers, et al, 1988:27)

5.3.2 Wh-argument Going over Wh-argument in Medial

As far as sentence type 7 is concerned, both the native and Chinese groups allow far fewer answers to the lower clause than they do to others such as sentence types 5 and 6. The preschool children in deVilliers' study reacted in the same way. However, the ungrammaticality of sentence 7 is still cloudy.

Lasnik and Saito (1988b) have discovered the NP/PP asymmetries (see sentences 8 and 9) which they think indicates that PP's are never lexically governed. On the other hand, they have also found cases like sentence 10 that suggest that complement PP's can be lexically governed.

8. ?? Who did they leave before speaking to?

9. ?* To whom did you witness John's attempt to give artificial respiration?

10. ?? On what shelf do you wonder whether to put the book?

They then raise the question whether a complement PP is directly theta-marked by a verb or not since theta role assignment is a necessary condition in lexical government (Ch.5, p.6).

Theoretically, the trace in the lower clause is lexically governed by the verb "throw" if we consider the subcategorization of "throw" is [throw NP2 NP3] in sentence 7. On the other hand, "throw" can also be subcategorized as [throw NP PP] as in sentence 11.

11. Who did the girl ask -- what to throw to -- ?

In sentence 11, it is clear the gap in the lower clause is governed by "to" and sentence and 8 is acceptable. The gap left by WHAT is lexically governed by the verb,"throw". The question is whether the gap of WHO, which is assigned as goal is also lexically governed by the verb.

5.3.3 Wh-arguments and Wh-adjuncts

In Roeper and deVilliers' study, young children distinguish arguments from adjuncts and they are more likely to answer Wh-argument questions than Wh-adjunct questions. A similar phenomenon has also been found in the current study. Although a considerable number of informants answered questions in embedded clauses when the COMP position was empty, informants answered argument questions more often than adjunct questions and the difference is significant

(mean score for argument questions was 1.26; mean score for adjunct questions was 1.05).

When the medial COMP is filled with a Wh-adjunct like sentence types 5 and 6, informants answer Wh-arguments like 5 more often than Wh-adjuncts like 6. Total responses to embedded clauses of these two types are calculated and the difference is significant. See Table 11 and Figure 5.5.

Table 11:

Table 11: Wh-argument and Wh-adjunct Going over an Wh-adjunct

	NO. of Cases	Mean	2-tail Prob.
Wh-arg.	180	.8778	.000
Wh-adj.	180	.6065	

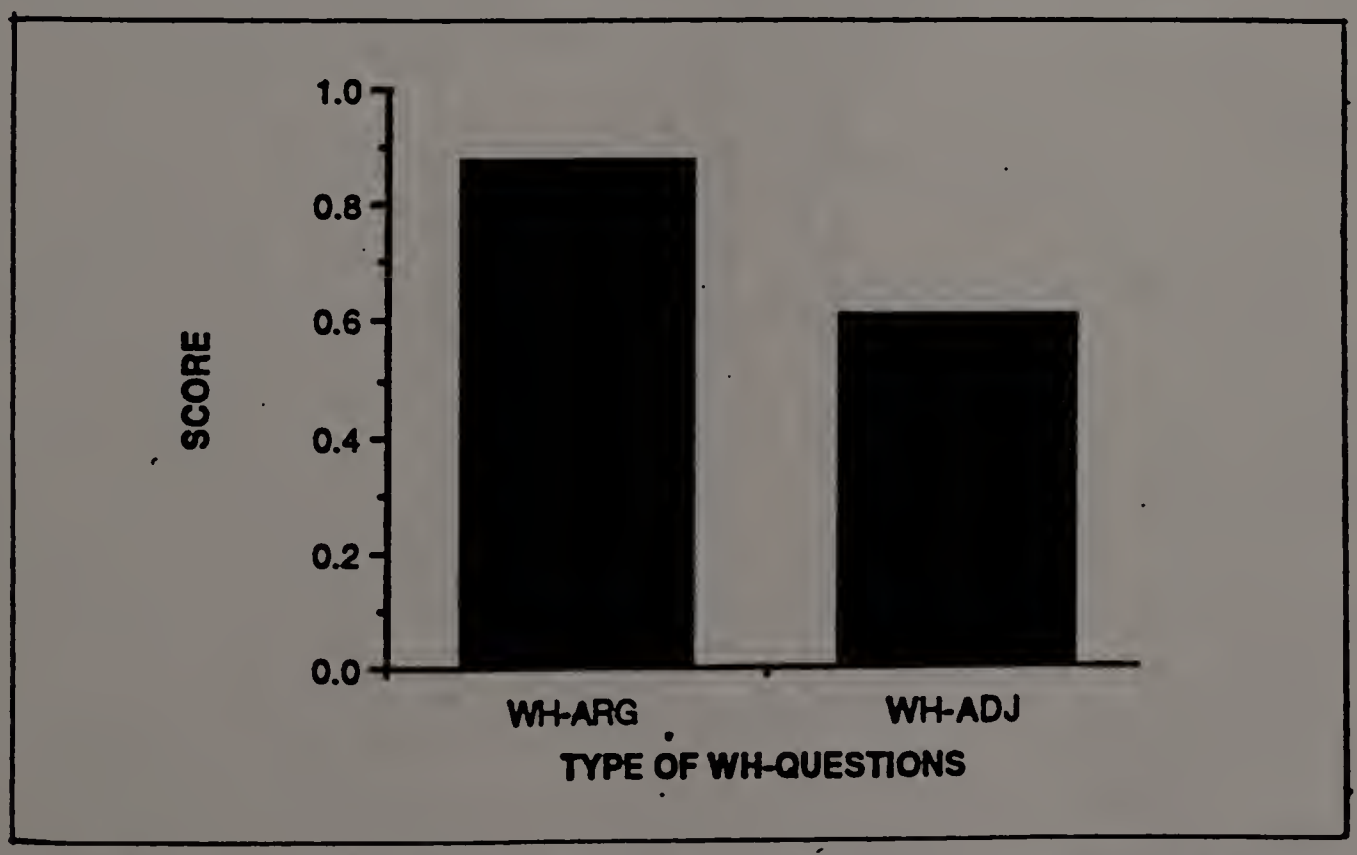


Figure 5.5 Long Distance Interpretation over Wh-adjuncts

We know that the trace in the embedded clause of 4 is properly governed by the verb. Even if the sentence does not obey Subjacency, it is not totally unacceptable.

The case of empty COMP is somewhat different because in both argument and adjunct cases, the traces in the matrix and embedded clauses are properly governed -- adjunct traces are antecedent- governed and argument traces are both lexically and antecedent- governed. Although this double proper government is superfluous in current theory, it is suggested that Wh-arguments might directly move to the matrix COMP without leaving a trace in the medial COMP (deVilliers, et al. 1988). Probably, the property of the theta role of the argument is so salient that it is easy to find its case assigner. The relationship between the assigner and the assignee is subcategorized while the positions an adjunct can attach to is much more flexible. Chinese also shows the same characteristics. This might also be universal.

5.3.4 Answers to the Wh-medial Question

The young children in Roeper and deVilliers' study give many answers to the Wh-words in the medial question. This phenomenon gradually decreases as children grow older. By the third grade, answers to the medial Wh-question are rare.

Is this a question of maturation or a question of language proficiency?

Compared with the children, adult L2 learners answered very few of the Wh-medial questions. Only 20 out of 180 informants answered one Wh-medial question and 13 informants answered two Wh-medial questions out of 20 stories. When we compare the English proficiency level between those who answered two Wh-medial questions and those who did not, significant difference is found at .052 level (see Table 12). The English proficiency score of the former group is much lower than that of the latter. As argued earlier, this can not be due to maturation. Therefore, their English proficiency level might be a factor affecting informants who answered Wh-medial questions. Interlanguage development typically shows no movement at the very beginning, then shows local movement and finally LD movement.

Table 12: English Proficiency Level of Informants Who Answer Medial Questions

Group 1: Informants who answered at least 2 medial questions
Group 2: Informants who did not answer any medial questions

	No. of Cases	Mean score	SD	2-tail Prob.
Group 1	13	17.85	5.46	.052
Group 2	147	14.50	5.17	

Mean score refers to points deducted due to errors.

CHAPTER 6

GENERAL DISCUSSIONS AND TENTATIVE CONCLUSIONS

6.1 Accessibility of UG to Adult L2 Learners

UG is based on the assumption that human beings are born with the mechanism to enable them to acquire a language. This mechanism allows all human beings to know the common properties of languages. Children no doubt have this knowledge without being taught. Adults have this knowledge and use it effectively when they speak.

When adults learn a L2, they do not learn as well as children in terms of final attainment. One popular explanation is attributed to their age which handicaps their language learning ability because they have passed the "critical period". The same explanation is also used when adults do not do well in experiments that test their sensitivity of a UG principle. Some researchers think that UG principles are not accessible to adult L2 learners because "the window of opportunity" is closed.

As for UG operating in adult L2 learners, it certainly functions in their native language. The question actually is whether UG knowledge can be transferred from their L1 to their L2. When certain UG principles do not apply in their native language, do adult L2 learners know this principle in

L2 when their language proficiency has researched a certain level?

Whether UG is still operative for adult L2 learners is one of the controversial issues in recent L2 acquisition. Research and previous studies support different views. Two studies (White 1988; Phinney 1987) hold that UG is still available; other studies (Bley-Vroman et al., 1988; Johnson 1988) maintain that UG is partially operative; and still others (Clahsen & Muysken, 1986; Schachter, 1988) assert that UG is not accessible to adult L2 learners.

Results of the study being reported here do not seem to support the last view; and it is obvious that L2 learners have shown constraints on extractions from different island conditions. In the judgment task on Subjacency, which was similar to one on Bley-Vroman's study, over 70% of the informants in Chinese Group 1 whose native language did not observe Subjacency rejected sentences with violations of Subjacency. Their performance was above chance level, but how does one explain the discrepancy of scores between L2 learners and native English speakers? Bley-Vroman et al., have reason to believe that language proficiency does not account for the difference, for informants in their study had obtained high scores on the Test of English as a Foreign Language (TOEFL) and all of them had had at least three years' immersion experience in an English speaking country. However, the 180 informants in the large group being

reported on in the study are all freshmen and sophomores in college and none of them has ever been to another country, let alone to an English speaking country. Their English knowledge was acquired through formal classroom instruction. However, their performance on the judgment task was above chance level and the proficiency test shows they had a knowledge of complex structure and therefore were ready for the task.

Even though informants demonstrate their readiness for a task, it does not mean their English is as sophisticated as that of native speakers. Neither does readiness for the task mean they can do the task as well as native speakers. Readiness only means they are able to do the task. How well they can do it depends on the sophistication of their knowledge of English. Acquiring sophistication takes time for Chinese students and presumably for Japanese and Korean students as well. Here, "time" refers to the time in which they are heavily involved with the language. So measurement of language proficiency has always been a problem (Schachter 1989), and it still is. TOEFL scores might be a good indicator of language proficiency, but acquiring test strategies might help one to raise the test score by 30 to 50 points and, by the same token, test anxiety might lower one's score by 30 to 50 points in a time-limited test. As for immersion in a target-language environment, it is difficult to measure, and it depends on how much effort a

person has made. Therefore, time is not an effective measurement. Finding an effective language-proficiency measurement remains an unsolved problem.

Failure to find a correlation between their English proficiency and sensitivity to Subjacency leads one to think that the sample of Chinese informants, large as it is, is still homogenous in many ways: not only in age and learning experience, but also in English-proficiency level. A different sample with informants who had a more sophisticated knowledge of English might show a different result. The second Chinese Group of informants in this study was obviously more advanced in English than the first group. They had been in intensive English classes for at least three years and had continuously used English afterwards.

When their test results are compared with that of the native English-speaking group, no statistically significant difference is found among the different types of Subjacency violations and control sentences. It is clear that, in this case, sophistication of English knowledge is involved in triggering UG to operate. Only high-proficiency L2 learners are as sensitive as the native English speakers.

Another UG rule tested for in this study was ECP. In the judgment task, Chinese L2 learners thought that the Wh-island condition was less constraining than other island conditions. Their rejecting score for the Wh-island condition was much lower than that for CNPC and SSC.

According to ECP, gaps should be properly governed. In the Wh-island condition, all the gaps are lexically governed by the verbs, so ECP is not violated even though Subjacency is violated.

In the reading comprehension tasks, for the four types of Wh-questions, both Chinese and native groups allowed more Wh-LD movement in Wh-argument questions with Wh-adjuncts in medial such as: "Who did the boy ask - how to help - ?" In this sentence, the gap following "help" is governed by "help," so ECP is not violated.

No previous study on L2 acquisition has ever reported the sensitivity to ECP by L2 learners and adult native English speakers. In this study, the control group rejected the Wh-island condition in the same way they rejected CNPC and SSC in the judgment task, but they performed differently on the reading comprehension task. One factor that contributed to their performance was the context. When proper context (a story) was provided, they were likely to permit Wh-LD movements. Tense in the embedded clause may be a factor that contributes to the blocking of the Wh-LD movement. This explains partly why the control group rejected Wh-island condition overwhelmingly in the judgment task.

The L2 learners mentioned above are those whose native language does not obey Subjacency, so high target-language proficiency is required to reach the sensitivity of native

English speakers to UG rules. Other adult L2 learners whose L1, like English, observes Subjacency, can transfer their L1 knowledge to the target language and perform the judgment task as well as the native speakers, as several studies have shown (Felix,1988, Schachter, 1988). It might be easier for these L2 learners to reach a high proficiency level than the Chinese groups mentioned above.

Actually, the issue of accessibility of UG to L2 learners should be rephrased as the preconditions for L2 learners to realize fully the UG principles. The innate ability for a normal human being to acquire a language and to speak will not run out, because no one finds himself gradually losing the ability to speak as he grows older unless he has some health problems. Language Acquisition device is still operating when adults learn a second language.

When L2 learners' performance conflict with Subjacency or the ECP, they violate these principles but not violate UG, for they might follow other rules that UG permits. In deVilliers and Roeper's study as well as in the present study, many children and a few adults answer to the Wh-words in medial, which violate Subjacency. However, languages like German are found to permit responses to the Wh-word in medial because the initial Wh-word functions as a question marker. The question word does not need to front the sentence, which is called partial Wh-movement. Children and

adults who answer medial Wh-words might have adopted partial Wh-movement rule before they become sensitive to Subjacency and the ECP.

When we look at the performance of the Chinese L2 informants on Subjacency judgment task, we can conclude that Chinese Group 1 will obtain native-like sensitivity to Subjacency although it does not happen now. More language experience with the target language is a critical factor in reaching that level. It is not logical to state that UG is not accessible to them.

In sum, UG rules such as Subjacency and ECP are available to adult L2 learners, provided they have reached a high proficiency level in the target language, if their L1 and L2 have parametric variation on these UG rules. If their L1 and L2 share the same parameter on certain rules, positive transfer is likely to take place.

6.2 The Development Issue

One question raised at the beginning of the study is whether adult L2 learners follow the same pattern as children in acquiring English. It might not be accurate to compare the children's answers from deVilliers' study with the adult informants' answers in this study, because the questions were asked in different ways. In this study, along with a question similar to one asked in deVilliers' study, a

second question was asked for each story:"Is there another answer? If yes, what is it?" The second question was meant to push the learners to think of downstair answers. The results clearly show that the method led more native speakers and L2 informants to the lower clause answer. However, when comparing the children's responses to Wh-LD movement in deVilliers' study and the native English speakers' and Chinese groups' responses to Wh-LD movement, in this study, we found that the three groups share more or less a similar pattern of response to different types of Wh-LD questions. See Figure 6.1.

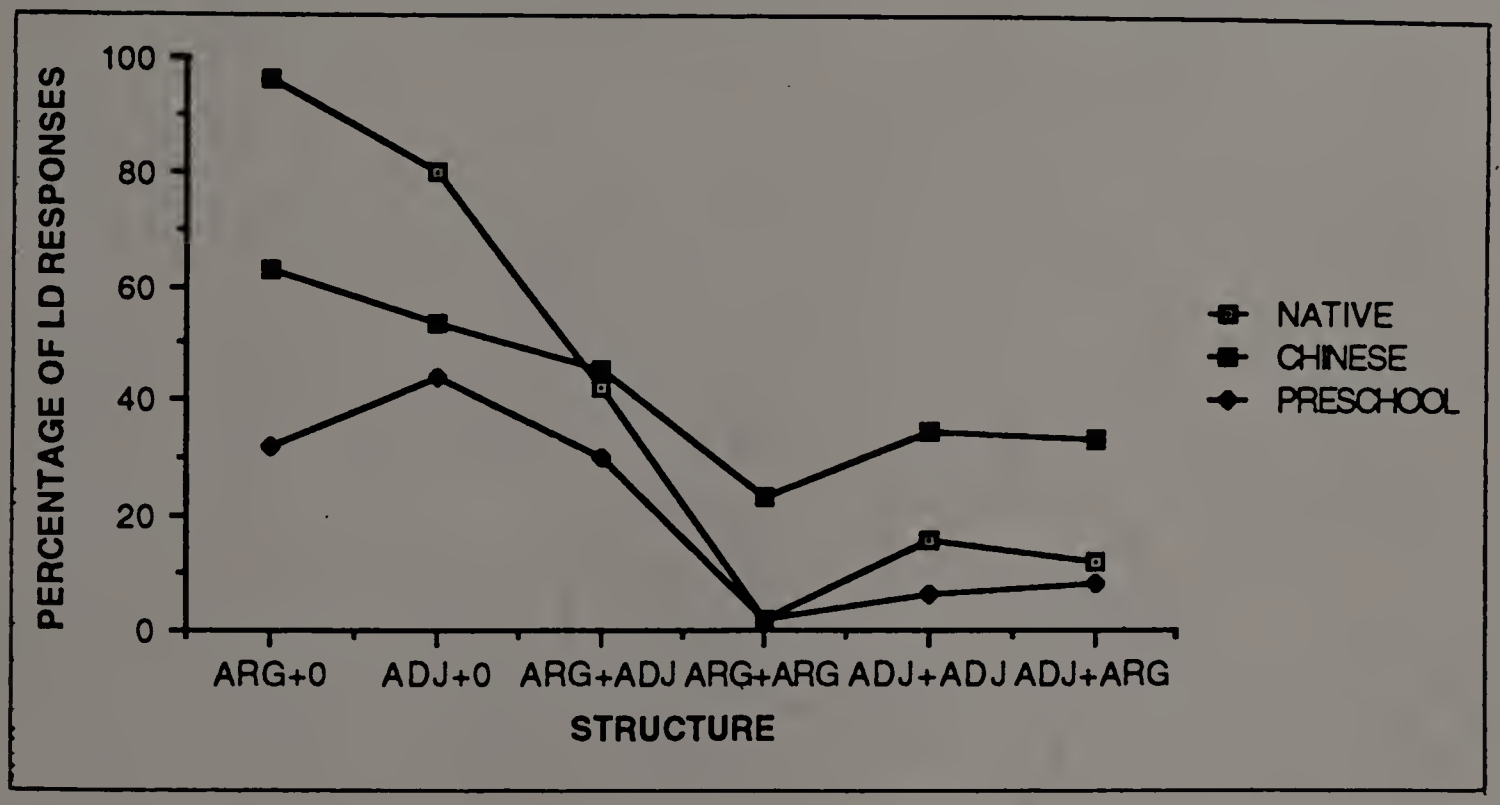


Figure 6.1 Long Distance Responses by Question Type

When there was no medial Wh-word in either Wh-argument or Wh-adjunct questions, all groups allowed more answers to the embedded clause. The English-speaking group and Chinese

group gave more downstair answers in Wh-arguments over zero medial questions but the children did otherwise. In Wh-island situations, all three groups allowed more downstair answers in Wh-argument questions to go over Wh-adjuncts in medial, e.g., "Who did the boy ask how to help?" This is just what the linguistic theory predicted, if informants are sensitive to the ECP. Although the linguistic theory that a Wh-argument question cannot go over a Wh-argument in the medial is not clear, all three groups gave far fewer answers to the lower clause in this type than in any other type. They are sensitive to something that blocks a Wh-argument LD movement. See Figure 7.

Pienemann (1988) suggests there might be an order in acquiring sentence structure; certain structures have to be learned before others. The study on Subjacency being reported here reflects how different informants responded to different structures of varying levels of difficulty. Figure 6.2 shows the score per sentence of three groups on different island conditions. A parallel line between the Chinese group 1 and Chinese group 2 is found, although the results of these two groups is significantly different. Figure 6.3 demonstrates the same pattern on Subjacency violations on RC and noun clauses. This suggests that these structures are different and the easy ones are learned before the difficult ones and the mastery of them is related to one's language proficiency in the target language.

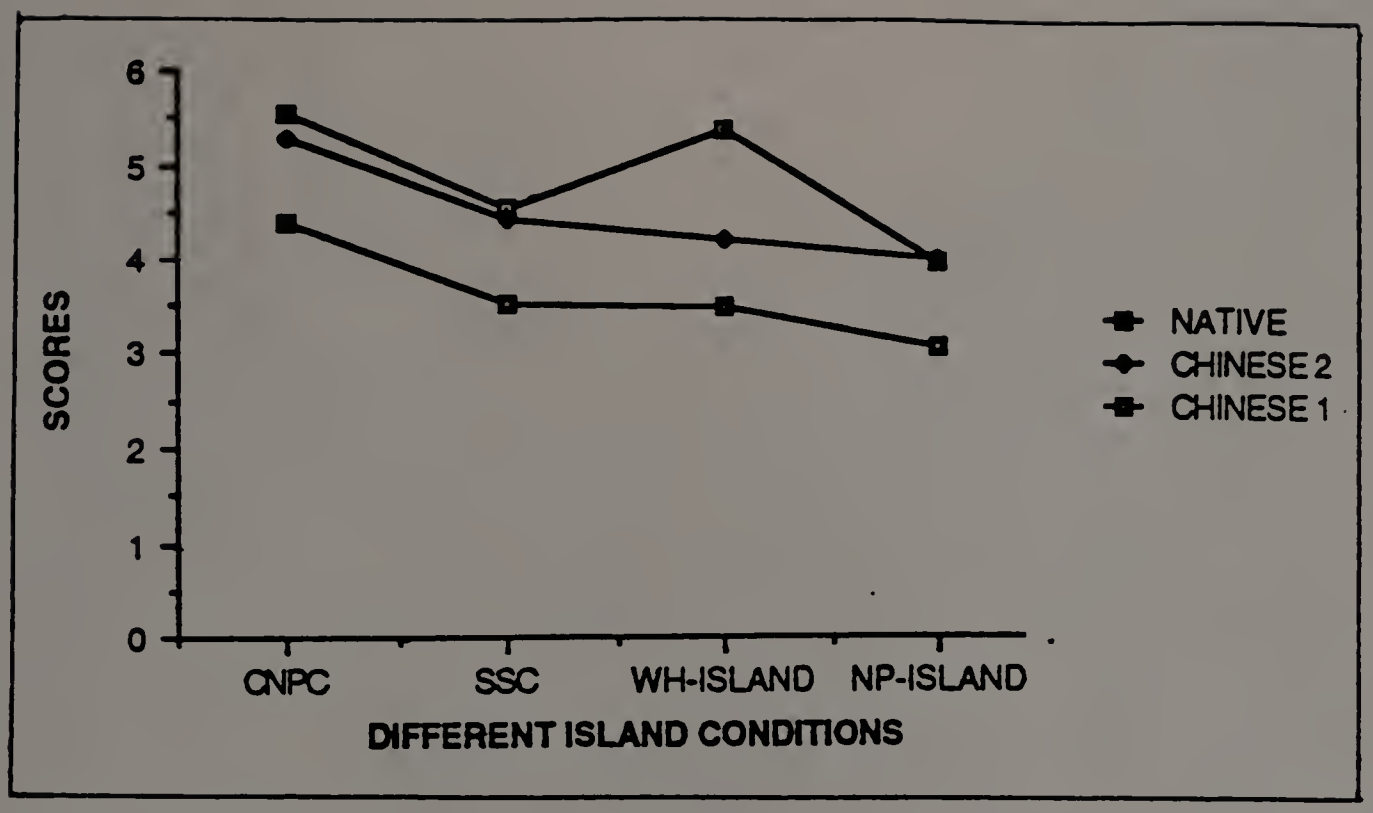


Figure 6.2 Rejection of Subjacency Violation

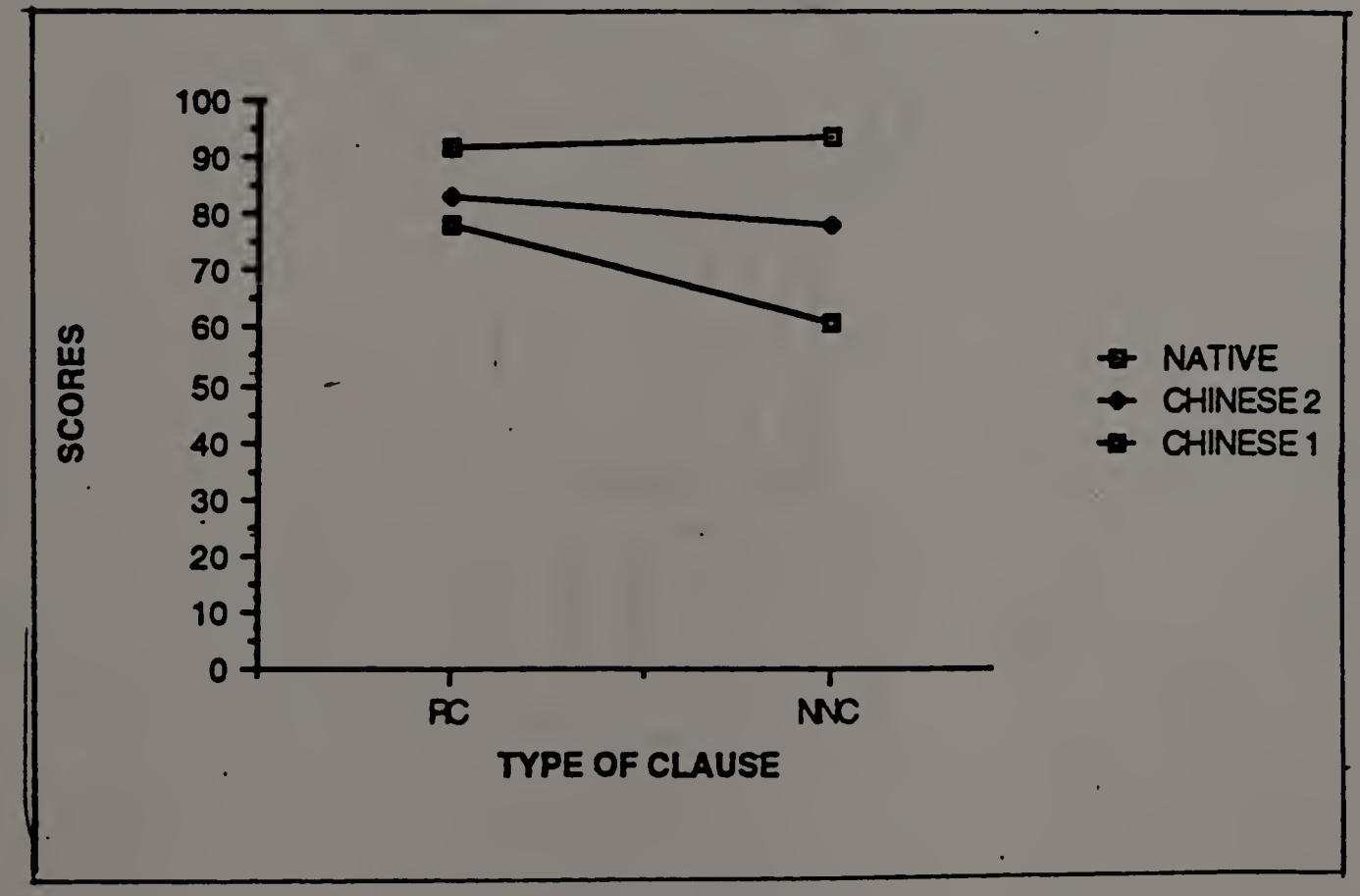


Figure 6.3 Rejection of Subjacency in RC and NNC Clouses

6.3 The Nature of the Empty Category for the L2 Learners

We found a similar pattern among the children's and L2 and control groups, as illustrated in Figure 1. We also found that the two Chinese groups have parallel lines, as illustrated in Figure 2 and Figure 3, which suggests that language develops in a certain pattern. When it comes to sentence structures, we observed that the easier ones are learned before the more complicated ones, e.g. yes-no questions vs. Wh-questions in the control sentences. In terms of judgment of grammaticality, the most salient ones were easier to identify. It is assumed that the more bounding nodes an element crosses the more salient the structure is to be identified as UG violation. The development sequence together with the interaction between L2 learners' L1 and L2 contributed to their L2 learning process. This was particularly true with the large Chinese group in this study, a discovery that is consistent with Hoekje's (1988) findings that Chinese children and adult L2 learners "saw English 'through Chinese eyes' -- they came to English as learners firmly imprinted with the hypothesis and expectations of their mother tongue."

The status of object gaps in Chinese is still not clear. White (1990) proposed that the Chinese L2 learners might treat the ECs as small pros, since, as XU (1986) noted, Chinese allows object-deletion. This is in opposition

to Huang's idea (1984) that the empty object is interpreted as empty topic, thereby the EC is bound by a variable. Nakayama (1988) found that there are different explanations for null subjects and objects. Li (1985) considers both null subjects and objects in Chinese as pro while Ni (1987) analyzes null subjects as variables bound by empty topics; for the Japanese language, Hasegawa (1984/85,1988) shares the same idea as Huang but Hoji (1985a,b,1988) and Hoji and Saito(1986) consider both empty NP's as pro. The acquisition data (Hoekje,1988) shows a decrease of object deletion and an increase of resumptives in relative clauses, with improvement of English proficiency. This suggests that, on a particular structure, L2 learners maybe transfer their L1 to their target language at the beginning. In their interlanguage, Chinese L2 learners first allow object-deletion in English, then realize that English is a sentence-oriented language and object deletion is not allowed, and later on they even permit resumptives in RC, overgeneralizing the rule.

The acquisition data also show that, for main clauses, low-proficiency learners show a higher percentage of object-deletions than do high-proficiency learners. This suggests a learning process in which Chinese learners bring their L1 properties into the L2 and, with positive input, progress towards an understanding of English grammar. Chinese L2 learners have to learn language-particular rules, such as,

"English does not allow object deletion. English is a 'sentence oriented' language rather than a 'discourse oriented' language like Chinese."

Although this does not seem to be a satisfying solution, it might account for the discrepancy on the Subjacency task between the large Chinese group and the native English speakers. From accepting object-deletions in Chinese to rejecting them in target English, takes time. Moreover, while they accept object-deletion, and naturally treat object gaps as small pros, movement is not involved and therefore they feel these sentences are not subject to Subjacency. The Chinese learners in the big group are at the stage in which they are developing the target language (English) but have not yet reached a certain sophistication level . They treat most of the gaps as traces left through movement but might regard 30% of the gaps as small pros. They bind more gaps to the Wh-variable as their English proficiency improves. The Chinese group 2 is a case in point.

No L2 learner has ever been taught Subjacency conditions but they sense this UG rule once they have reached a high level of English proficiency. They will utilize this UG rule earlier if their native language observes it. However, certain conditions are required before L2 learners are able to recognize (unconsciously) this rule. Target language structures, such as RCs and noun clause, can

be taught, and emphasizing these features may stimulate the learning process.

6.4 Sensitivity to Different Island Conditions and the ECP

One of the hypotheses of this study was that L2 learners' performance on Subjacency and ECP is predicted by linguistic theory. First of all, we had to know whether Chinese L2 learners are sensitive to Subjacency, which cannot be transferred from their L1 as Chinese does not have syntactic Wh-movement, nor is it usually taught through instruction for many teachers are not aware of this rule. If learners show limitation on extraction over more than one bounding node, we do not know whether they distinguish crossing two from crossing three bounding nodes. We already know that sentences which violate Subjacency are not the same in terms of the degree of ungrammaticality because the moved elements in some cases have crossed more bounding nodes than in others. Violation of CNPC involves crossing three bounding nodes while violation of Wh-island, SSC, and NP conditions involves crossing only two bounding nodes.

Both Chinese groups and the native English-speaking group had a higher score rejecting CNPC than rejecting the other Subjacency violations (see figure 2). Even though there is a significant difference in scores between the natives and the large Chinese group on their judgment of

different island violations, the Chinese group demonstrates the same pattern -- obtaining higher scores on rejecting CNPC than on other island violations. This suggests that the more bounding nodes a moved element crosses, the more likely a sentence will be rejected.

Two types of sentences of the CNPC (RC vs. NCC) were treated by the large Chinese group differently. They had a higher score for relating RC than for relating noun complement clauses because mastery of the latter involves the acquisition of the idiosyncratic properties of the head nouns. Not all the nouns can be followed by a noun complement clause and this adds to the level of difficulty in learning the noun complement clause. However, once Chinese L2 learners have acquired a sophisticated knowledge of English (that is, they know language particular rules), they will totally reject Subjacency violations in RC and noun complement clauses. No differences between RCs and NCCs was found in either the Chinese group 2 or the native group[18].

In the reading comprehension task, six types of Wh-LD questions were asked and the percentage allowing long distance answers in both the native and Chinese groups bore out the theory tested. When the Wh-island condition was not involved, that is, no Wh-word in medial, L2 learners permitted more LD answers. In the cases in which Wh-island conditions were involved, they allowed more LD answers when

the trace was properly governed. In this study, these are argument traces and lexically governed by their heads -- the verb. However, the percentage of responses to the embedded clause was still lower than when there was no medial Wh-word. This again demonstrates Chomsky's statement (1986)that only when 0-Subjacency is involved, can full grammaticality be achieved.

6.5 "Critical Period Hypothesis"

This study did not directly aim to test the "critical period hypothesis"; nevertheless, the results of the study do not seem to agree with Johnson's finding (1988) that Subjacency decays over maturation. We found, instead, that it remains accessible, albeit sometimes minimally, over maturation.

Two Chinese groups were tested on Subjacency and one test was on ECP. When the large Chinese group was not able to perform as well as the native English-speaking group, it was not because of their age but because of their English proficiency. The smaller Chinese group was much more proficient in the English language, and their performance on the Subjacency task was not significantly different from that of the native speakers. It is the language proficiency that helped fully actualize the UG rules, not the age of the students.

Sometimes age stands out as a factor, but a close examination will find that when an L2 learner starts young, he/she will have many advantages over adults. First of all, he/she will have more time to learn the target language. When a person starts early, L2 development goes hand in hand with his or her or his L1 and cognitive development, thereby reducing the negative psychological factors. Early learners avoid being embarrassed by the imbalance between their L2 performance and their advanced cognitive capacity.

Hoekje in her study (1988) has found that the L2 environments experienced by the children generally facilitated their learning English, whereas much of the adult experience in their L2 environment was either not helpful or a hindrance to L2 learning. The dimensions of the language-learning environments, in themselves, had huge implications for children's success in L2 acquisition, and it is not surprising to have found linguistic differences between groups (children vs. adults), at least in rate of acquisition (p.364-366).

6.6 Tentative Conclusions

1. Although COMP is not available in Chinese, Chinese learners allowed Wh-LD movement when the COMP in the embedded clause was not filled in English.

2. When the COMP in medial was filled, the Chinese learners (like children and native speakers), gave answers to the lower clause when the trace was properly governed. In other word, they were very sensitive to ECP effects.

3. Like native English speakers, Chinese learners distinguished argument questions from adjunct questions; they allowed more answers to the lower clause in argument questions than in adjunct questions.

4. Even though Chinese does not observe Subjacency, Chinese L2 learners demonstrated limitation on extraction from island conditions. Once they had sophistication in the target language, their performance score on Subjacency tasks showed no difference from that of the native English-speaking group.

5. Like the children in deVilliers' study, some Chinese learners also gave replies to the Wh-word in medial, but the number was very small. Those who answered the medial Wh-questions had significantly lower scores on the English proficiency test than those who did not answer the question. This implies that answering or not answering questions of this type relates to an individual's language proficiency and may relate to his/her maturation as well.

6. Since Chinese has object-deletion and English does not, some Chinese L2 learners treated gaps in the embedded clause as small pros in their interlanguage and gradually treated gaps as traces left through Wh-movement. This might

explain why Chinese L2 learners did not perform the Subjacency task as well as the native English speaking group.

6.7 Issues That Need Further Consideration

The present study has found that adult Chinese L2 learners treat Subjacency violations in different island conditions differently, but several related issues have not been studied which might be worth further consideration.

First, Is a tensed clause more of a constraint than that of no tense in Wh-island conditions? In the current study, we have found a difference between Wh-argument questions and Wh-adjunct questions going over Wh-adjunct in the medial. The result that the former type of questions get more responses than the latter corresponds previous studies by DeVilliars and Roeper (1988, 1990). Chomsky (1986b) proposes that the lowest IP is an inherent barrier for Bounding Theoy if it is tensed.

?What do you wonder $[_{cp}$ where $_j$ $[_{ip}$ Pro to put t_i t_j]]?

*What do you wonder $[_{cp}$ Where $_j$ $[_{ip}$ John put t_i t_j]]?

Although the current study has both types of sentences, they are in different tasks, that is, one is in the judgment task and the other is in the comprehension task. Therefore, the responses to them can not be compared and we do not know whether tense in the embedded clause is a constraint.

Another issue is about the difference between Subjacency violations in RCs and NNCs. The 180 Chinese students treat RCs differently from NNCs but difference is not found in the 16 Chinese informants with high English proficiency and English native speakers. This is consistent with the findings of White al et.(1991). In Martohardjono's study (1991), both native English speakers and L2 group treat Subjacency violation in RCs and NNCs differently. The rejection percentage of Subjacency violation in NNCs is much lower than that in the present study and White al et.'study, which might be due to different lexicons involved in this structure types.

The third question is whether a complement or an adjunct of a noun makes a difference in extraction out of a NP. In the judgment task, both the Chinese and English-speaking informants allow more Subjacency violations in NP-island sentences than that in CNPC and SSC. The English speakers even accept more extractions out from NP-islands than Wh-islands. Roeper suggests that extraction out from a noun phrase can be worse than from a clause, e.g. "What did you buy a loaf of -- ?" More extractions involving the NP-island condition in the judgment task might be from complements than from adjuncts.

CHAPTER 7

LINGUISTIC THEORY AND L2 TEACHING

The current study has explored several issues in L2 acquisition. Although the results are not conclusive, they provide evidence to support the contention that UG is still accessible to adult L2 learners and there might be an acquisition sequence in learning a particular language. Discussion of the results helps understand L2 learners' interlanguage and the role of L1 in L2 acquisition. Will these results have any direct impact on language teaching? There is no doubt that linguistic theory and L2 research give greater insights into the nature of a language and the learning process of the learners. However, thoughtful consideration of the practical implications for language teaching is not common. Very few L2 researchers react to the relationship between teaching and UG theory.

White (1989) feels that extreme caution is needed when direct applications to language teaching are thought about, because she thinks linguistic theory and research will not directly offer methods for language teaching.

Different from White, Flynn (1990) has recently explored the possibility that linguistic theory can benefit language teachers. In her view, study of UG theory helps language teachers have a better understanding of what knowledge an adult L2 learner already has; a better

understanding of the linguistic knowledge an adult L2 learner has will help teachers to develop more appropriate and effective teaching methods. Flynn has also made some concrete suggestions about how this knowledge can be used in teaching an L2 language. Take classroom composition for example. She (1990) suggests "a mixed model consisting of both heterogeneous and homogeneous groupings based on differences and similarities of parameter-settings of the first language would be beneficial." When talking about head-direction parameter, Flynn suggests that L2 language teachers can teach Noun Phrases (NPs) and Noun Complement Clauses (NCCs) in English together because they share the head-first parameter.

I think as a L2 researcher, we should try to connect our research findings with language teaching. Although linguistic theory and research will not directly offer methods for language teaching, they can provide teachers with implications for language teaching. A better understanding of the nature of languages and the processes of learning a language will help language professionals discover more effective ways to facilitate their language teaching.

I agree with Flynn that UG theory will help language teachers have better understanding of a language and of the knowledge an adult L2 learners has, which I think is its major contribution to L2 teaching. As for the concrete

suggestions, we should consider real classroom situations and its practicality. On the other hand, we should bring all the positive factors into play since language learning takes place in a very dynamic social situation. I will discuss these suggestions in detail later.

Apart from this perspective, UG theory and UG related L2 research can help teachers to look at some controversial issues in L2 learning from a new perspective which, in turn, will have some implications for L2 teaching.

In this chapter, I am going to further explore possible implications of the present research results for adult L2 teaching in terms of the following questions. Do adult L2 learners have access to UG principles? How is this issue related to L2 teaching? Does there exist a particular acquisition sequence in acquiring a language? What do insights from UG research suggest teaching approaches? When is correction helpful? What role does interlanguage play in L2 learning?

7.1 UG Related Issues

7.1.1 The Accessibility of UG to Adult L2 Learners

This is an old issue revisited. In the early 60's, the issue of "the critical period hypothesis" attracted a lot of attention. This hypothesis claimed that language should be

learned before puberty. Otherwise, a learner will be handicapped, having lost some abilities for acquiring language. This claim is often used to explain the failure of adult L2 learning or the disadvantage of adult L2 learners when their final achievement is compared with that of child L2 learners. The hypothesis was challenged as early as 1964 (Ausubel, cited by Stern, 1983) and afterward (Krashen,1971,1975, 1981, cited by Stern, 1983). But the question remained unanswered.

In recent L2 research literature, this issue is being reexamined within the framework of Universal Grammar. Three different views are held: UG is still operative for adult L2 learners (Flynn,1985,1987; White, 1987); UG is partially functioning (Johnson, 1988; and Bley-Vroman et al, 1988); UG is not available to adult L2 learners (Schachter, 1988; Clahsen and Muyken 1988).

The current study clearly shows that the higher English proficiency L2 learners have, the more they are sensitive to the UG principles. By English proficiency, I mean the learners' experience with the target language. Participated in this study were 25 native English speakers (control group), 180 Chinese university students living in China (Chine Group 1) and 16 Chinese graduate students studying in the U.S.. All 180 Chinese students (Chinese Group 2) passed the CELT, judgement and reading comprehension test, which means that they were all ready for the task requirement in

this study. Although scores on the judgment task show a significant difference between the native English speakers and 180-Chinese L2 learners in Chinese Group 1, the performance of Chinese Group 1 was above chance level. These L2 learners had never been immersed in an English-speaking country and did not use English outside the classroom. They acquired their knowledge of English through formal instruction and the particular rules for the judgment test had never been taught in class because English teachers were not aware of them. Where did this knowledge come from for these L2 learners?

The results for Chinese Group 2 show there was no difference in scores of the native English speakers and the L2 group on the judgment test. The L2 learners in this group logically had mastered more English than Chinese group 1 because they had studied and used English for more time than the other group. No one has ever been taught rules like Subjacency. How can we explain their performance so like that of native speakers on the Subjacency task?

Their knowledge could not have been transferred from their L1 since Chinese does not have syntactic WH-movement and Subjacency does not apply. The only explanation is that, like native speakers, their use of UG was made possible when their knowledge of the target language had reached a certain level. In other words, UG is still operative for adult L2 learners.

Why is this knowledge important to L2 teachers? Clarifying this issue will help adult L2 learners obtain a better understanding of their capacity to learn a second language. In addition to having more advanced cognitive ability and more sophisticated problem-solving skills than children, adult learners have absorbed the UG principles present in their L1. In these respects, adult learners are actually in a more favorable position than children.

And yet why is the ultimate achievement of adult L2 learners not better than that of children? Attempting to understand this issue will lead us to examine other areas related to L2 learning. For example, social expectations are much higher for adult L2 learners than they are for children; adults have far more psychological baggage than children do.

Apart from UG based studies, which demonstrate that UG is still functioning for adult L2 learners, studies from other L2 acquisition research show that the learning environment is more favorable to children in L2 learning than to adults. For example, Hoekje (1988) studied the acquisition pattern of Wh-movement in English by three Chinese children and three Chinese adults and found children learn particular constructions and sub-systems of English faster and more regularly overall than adults (p.361). She attributed this difference partly to the learning environment (365):

"The environment experienced by the children generally facilitated their learning English, whereas much of the adult experience was either not helpful or a hindrance to L2 learning."

In designing curricula for adult L2 learners, we can maximize such advantages as the adult's motivation, advanced cognitive ability, and experience with an L1. But we also need to create environments for adults that better facilitate acquisition. Adult L2 learners not only need plenty of comprehensible input but also need to interact with it. In other words, they need to interact with other people in English. They need rich language environment in reading and writing. Most of all, they need a supportive environment to help and encourage them to learn the language.

7.1.2 Dealing with UG Principles

The current study has shown that UG principles are accessible to adults in their L2 learning, which provide a piece of evidence to support similar assumptions made by some linguists. Rutherford, for instance, states (1988):

"UG, or the set of formal constraints upon the ways in which a first language may be presumed to develop, is a biological endowment of our species. And there is as yet no reason to suppose that these constraints are not still in

operation in adulthood, or for the acquisition of subsequent languages."

L2 teachers do not need to teach UG because it is a biological endowment. It will develop when L2 learners' target language reaches a certain proficiency level. The current study has shown that L2 learners show limitations on in extracting elements out of different island conditions when the rules do not apply to similar structures in their L1. The degree of sensitivity to UG depends on learners' target language proficiency.

While generative linguists are trying to find syntactic patterns across languages, they, at the same time, determine which are language-specific rules. These are the rules that L2 learners need to acquire in order to function in the target language.

What is the relationship between UG principles and language specific rules in L2 acquisition? "The aim of L2 research is to reach understanding of how languages are learned (White, 1990)." It is true that L2 acquisition research is not a search for teaching methods. However, a more complex understanding of the L2 learning process might further help teachers to know what knowledge their L2 learners already have (most of it transferred from their L1) and what they need to learn. It will also indicate which language-specific rules need more attention and which rules they can expect will be learned before others.

7.1.3 Emphasis on Language Specific Rules and Lexicon

While discovering UG rules, linguists also found language-particular rules. L2 learners do not need to be taught the universal rules because they will be realized automatically at a certain point of their L2 development. As for the specific rules of a language, is it necessary to teach them?

In L2 teaching, a communicative approach is emphasized, and meaning is the key. To express oneself more effectively and powerfully, one has to master linguistic forms, i.e., sentence structures which increase one's grammatical knowledge. It is still widely recognized that focusing on linguistic form aids in the acquisition of grammatical knowledge (Rutherford, 1988). In other words, raising learners' consciousness of the nature of target language rules helps adult learners to internalize them when they have rich target language input and have the motivation to use the language.

In addition to specific rules for different tenses, aspects, and different parts of speech in English, L2 teaching needs to address subcategorization which also involves language-specific rules with which L2 learners have a lot of difficulty, but it does not receive enough attention. In English, each transitive verb is subcategorized to take an NP, or PP or S. Violation of the

subcategorization rules will result in ill-formed sentences. However, no patterns have been found to determine which type of verbs have to take an NP or a PP. It is the idiosyncratic properties of the verbs that decide this.

In search for the general patterns across languages, it is hard to separate syntax from semantics. Take "think" and "wonder" in the following sentences (Grimshaw,1979) for instance.

a. John wondered who Bill saw.

b.* John wondered that Bill saw someone.

c. John thought that Bill saw someone.

d.* John thought who Bill saw.

Both predicates are subcategorized for a clause but there are some limitations on the clauses a predicate can take. Grimshaw suggests subcategorization expresses restrictions between predicates and the syntactic category of their complements (1979). Semantic selection expresses restrictions between predicates and the semantic type of their complements. In English, the clause following "wonder" must be a direct or indirect question, the one following "think" must be a that-complement. In the above cases (a-d), the meaning of the predicate can inform learners about the semantic type of the complements it can take to some degree. When the semantics of a predicate cannot offer enough

information about what it can take in the target language, L2 teaching needs to address these rules.

7.1.4 Consciousness Raising

Consciouness raising is a method which is not really new in language teaching. However, it has its new value in content and task-based L2 classrooms. Rutherford and Sharwood Smith (1988, p.107) define consciousness raising as "the deliberate attempt to draw the learners' attention specifically to the formal properties of the target language." When L2 learners are provided with rich input and are encouraged to interact in a supportive environment, consciousness raising will speed up language acquisition. L2 learners should not pay too much attention to the UG rules, and instead, they should pay attention to specific rules of the target language. Not only should L2 learners emphasize grammar rules but also the idiosyncratic properties of some lexicon items of the language. Once they grasp these rules and have more knowledge of the idiosyncracy of the target language, they may communicate more effectively.

Many instructional methods in content-based classrooms also emphasize specific linguistic forms. The learner is encouraged to induce the rules and form a more or less conscious mental representation (Ellis,1986). Several studies have shown that explicit grammar instruction is very

effective in L2 learning (Chaudron, 1988). To facilitate grammar instruction and learning, rules are presented and practiced in context so learners know how to use them to achieve a certain task. Researchers for the Swedish Gume Project also found differential effects for explicit over implicit rule instructions for adults, females, and "an accelerated adolescent group" (Chaudron,1988).

7.2 Acquisition Sequence

Is there an acquisition sequence in acquiring a particular language? This question always fascinates L2 researchers as well as L2 teachers. The answer to this question might help L2 teachers decide when to focus and when to expect competent performance. For the acquisition of morphemes or of grammar rules, several studies (Newmeyer and Weinberg, 1988; Smith, 1988; Bailey, 1974; Dulay and Burt, 1973; Felix, 1985; Huang, 1982; and Fillmore, 1976) have found that adult L2 learners have patterns similar to L1 children.

When there is a certain order in learning a particular language, certain structures should be acquired before others. Consciousness raising will be more effective. This has already been supported by Pienemann's study (1988) about the acquisition order in German. Learning will be more effective if this law is respected.

In the current study, informants better detected violation of Subjacency in the RC's than in the Noun Complement Clauses. The informants found RCs more difficult to process than NNCs when extractions from the embedded clause are involved. Although RCs look similar to NNCs, the former involves one more transformation than the later. Furthermore, the idiosyncratic property the nouns in NNCs possess prepare learners to process a clause that follows, which makes understanding a NNC easier. We can assume that L2 learners learn NNCs before than RCs. One might ask, however, how the acquisition sequence of a target language, if there is one, should affect L2 teaching.

7.2.1 How Consciousness-raising Might Be More Effective

When there is a sequence, L2 learning might be more meaningful if it follows the learning acquisition order, for certain rules have to be acquired before others. The rules learned earlier serve as the foundation for rules learned later. With the prerequisite knowledge, L2 learners can integrate the new rules, making learning take place. Children talk in one-word or two-word sentences before they use whole sentences and complex sentences. The same is true for the adult L2 learners. Mentioning conditions in L2 acquisition, Spolsky agrees that "languages are in fact structured in such a way that logically one must learn

certain things before others. Just as, in mathematics, learning addition and subtraction is before learning multiplication and division (1989)."

On the other hand, L2 learning is different when learners have a rich target language environment. Natural input from the environment prevails regardless of acquisition sequence. Both children and adults can pick up any structures of interest because the context provides scaffolding. Even so, when grammar is learned as a conscious system, respect for learning order will make a difference.

It seems hard to believe that children and adult L2 learners share the same acquisition order of a language, for the latter have already acquired the knowledge of one language before they study another language. When L1 knowledge conflicts with L2 on a particular rule, one can assume learning this rule will either be accelerated or delayed depending on psychological factors. A striking difference between L1 and L2 on a structure makes L2 learners very sensitive, which helps them raise consciousness, facilitating learning. On the other hand, when L2 learners are not aware of a difference in a particular structure in their L1 and L2, they usually overlook the difference and transfer their L1 structure to L2, which delays their learning of this particular structure. In other words, L2 learners still follow the same

acquisition order. This corresponds to what previous studies have found (Flynn, 1987; White, 1987).

To respect the acquisition order in L2 teaching is an important element to make learning more effective, especially when students have to be evaluated by taking the standardized assessment. In a content-based or task-oriented curriculum, respecting the acquisition order will enhance L2 learning. It is helpful to keep this in mind when we make suggestions for L2 teaching. Flynn(1987) proposed a parameter model for L2 acquisition which has connected recent linguistic theory to L2 acquisition, undoubtedly advancing L2 acquisition theory. She has also tried to link theories to L2 teaching, and suggests teaching L2 according to parameters. For instance, in teaching the head direction parameter, teachers of English can teach learners NP, PP, and noun complement clause because they share head-first parameter. L2 teachers will find it hard to follow this suggestion simply because these rules happen at different times in the learners' development. You can teach an L2 beginner NP's but you cannot teach them noun complement clauses at the same time, for they need to learn other rules before they learn the noun complement clause.

Nevertheless, the real world often requires teachers to consider many other factors in order to meet L2 learners' demands. What is the consequence of violating the acquisition order?

7.2.2 Learning by Chunks

Actually, learning by chunks is an indispensable process in L2 learning. For various purposes, many L2 learning models have appeared such as task-based, competence-based, functionally approached models. Some of these models were established to satisfy the immediate need of the learners to function in the English-speaking country or for a particular task. They have to learn certain expressions to be able to shop, to bank, and to ask questions in the shortest possible time. They do not have the time to follow the acquisition order of the target language. Highly motivated, these learners utilize all their strategies to learn the language and to use what they have just learned.

Even in L2 classrooms, learners need to know how to ask questions, get information, get help and respond to questions before they learn language specific rules. It is helpful for them to remember expressions (as a chunk) "What is the meaning of the word "...?" "Could you tell me how to...?"

When will these chunks be analyzed by L2 learners? Language-input processing, like other information processing, is based on prior knowledge. If the prior linguistic knowledge system is ready for the new input, the short-term memory will immediately make sense of the input,

analyze the discrete units and integrate them into long-term memory. With the knowledge in our long-term memory, we can create an unlimited number of sentences we have never heard before. If prior knowledge is not sufficient,, either learning will not take place or learners will tend to retain sentences or expressions by chunks. These chunks help them to achieve a particular purpose but only after they have acquired other rules which are considered "prior knowledge" can they break these chunks into discrete units and internalize them into the long-term memory. "To break and analyze chunks is a necessary condition in L2 learning."[19]

If the teacher has a good understanding of the acquisition sequence, he can combine it with learners' immediate needs and help them learn the target language effectively.

7.2.3 Necessary Correction

One of the differences between L1 and L2 acquisition lies in the availability of negative evidence. In L2 acquisition, Comrie (1990) asserted, "negative evidence is provided in the form of correction." Linguists are always amazed at how quickly children learn language rules when they lack negative evidence, for adults seldom correct children's speech. Unlike children, adult L2 learners often receive lots of correction from their teachers, friends, and

even their children, which presumably helps them learn language rules.

Are these corrections necessary or helpful to help them learn language rules? As we know, adult L2 learners are confronted with an imbalance between their L2 proficiency and their mature cognitive capacity and they are expected to participate in sophisticated conversations in the target language. They often make errors when their speech involves more complicated sentence structures or rules. They will not immediately analyze the structures or rules after the corrections are made. In other words, they will learn the easy structures or rules before the difficult ones. Learners will not internalize the corrections until they are ready. Language teachers are often puzzled why their students make the same errors that they have corrected time and again. Apart from others factors, the fact that the student might not be ready to internalize a particular structure may account for the failure. The discussion session on error correction at TESOL 91 reports that it is counter-productive to correct mistakes against rules the students have not dealt with yet. Therefore, making necessary corrections according to learners' target language level may be more effective in helping them to grasp the rules.

However, the "implicit correction" advocated by Krashen[20] is always helpful in terms of increasing positive

input without dampening the L2 learners' confidence in communicating in the target language.

7.3 Understanding Interlanguage

7.3.1 L1 Plays a Role

Another major difference between L1 and L2 learning lies in the role of one's L1 in L2 acquisition (Comrie,1990). L2 learners do not start learning L2 from a "clean slate" and they bring their L1 knowledge into L2 acquisition. This is not only true for an adult L2 learner but also true for L2 children. It will be very helpful if L2 teachers keep in mind their students' L1 and the possibilities their L1 interacts with their L2 in their performance.

In pattern exercises like the following, a seven-year-old L2 learner[21] consistently misses the object of the verb when answering WHEN questions.

She broke the ruler in the last lesson.

Exercise Questions:	Answers:
What has she broken?	She has broken a ruler.
When did she break it?	She broke in the last lessen.
When did he finish it?	He finished last night.
When did she write them?	She wrote this morning.

If the teacher understands that the child transferred his L1 to English because his L1 (Chinese) allows null objects, she/he would realize that he did not make a random error. The teacher can help him by emphasizing such specific rules of English grammar as "an object is obligatory if the verb is transitive."

Very often, L2 learners will carry their L1 knowledge over to their L2. Teachers' lack of familiarity with their students' L1 will affect their evaluation and judgment of the L2 learners.

Although all languages are discourse-oriented, some languages depend more on discourse context than others. In other words, some languages require more strict linguistic forms than others. Take Chinese and English for example. Huang (1984) considers English "sentence-oriented" languages while he considers Chinese a "discourse-oriented" language. In "sentence-oriented" languages, the meaning of the sentence only needs minor participation on the part of the reader or listener. On the contrary, for "discourse-oriented" languages like Chinese, in which null subjects and objects are acceptable, comprehension of the sentence depends heavily on the context and involvement of the reader or listener. Chinese L2 learners of English usually bring to English such features of their L1 as omitting a subject or an object in a sentence.

Although L1 plays an important role in L2 acquisition, language learning takes place in a dynamic situation involving many factors, so we should try to consider every possible factor when making suggestions. Would it be effective to divide language classes based on the learners' L1? It might be easier to teach a class with the same language background, but some disadvantages can affect students' language learning. Learners tend to communicate in their L1 if they share the same L1, thus reducing the opportunities of real L2 communication in a language class. In an L2 classroom with cultural diversity, students can only have real communication in the target language and can also learn different cultural traditions.

7.3.2 Consciousness Raising on Mismatch between L1 and L2

Some studies (Flynn, 1987) suggest that when a mismatch between learners' L1 and L2 occur, learners are very sensitive to the difference between the L1 and L2 parameters. Other studies (White, 1987) show that learners initially fail to notice the difference. Learners in both cases are most likely to carry the L1 value over, treating the L2 data in terms of the L1 parameter. Different reactions to the mismatch between learners' L1 and L2 probably lie in the differences between their L1 and L2 in general. In Flynn's study, the subjects' L1 (Japanese) and

L2 (English) are very different, i.e., many of the L1 parameters are different from those of the L2, so from the start, the Japanese learners are very conscious of the differences. For White's subjects, their L1 (Spanish) and L2 (English) share many parameters. Therefore, subjects tend to neglect differences initially, when a mismatch of L1 and L2 parameters occurs.

When their L1 and L2 are very different, learners tend to focus their attention on the formal properties of the target language. Since languages share many commonalities, L2 learners are likely to overlook the mismatch between their L1 and L2 when the difference is small. Emphasis on any mismatch will shorten learners' interlanguage stage, facilitating their learning.

7.3.3 Identifying the Difficulty Level of a Structure

A better understanding of the general properties of learners' L1 and L2 will help teachers determine the difficulty level of structures in the target language. Take the case of Chinese learners acquiring relative clauses in English for example. Before studying RC's, they learn simple sentences first. They often delete objects, as this is allowed in their L1. Then they learn that object deletion is not acceptable in English and they retain objects when verbs require them. They put resumptives in RC's because they

think objects are obligatory in English. Finally, they realize objects have been moved and they can be deleted in RC's. It takes time for these learners to produce acceptable RC's.

The difficulty for Chinese learners in learning RC's is attributed to differences in object rules between their L1 and L2, whereas some other difficulties are attributed to a lack of a linguistic category. Xu (1985) found that Chinese does not have a lexical complementizer without semantic content (like the English THAT) which serves as a clause introducer. The expletive "it" also belong to this category. This causes difficulty when the learner has inverted the auxiliary to the COMP position and expletive "it" is required to fill in the subject position. Unlike semantic categories in which learners can transfer their L1 to L2, learners have to learn the rules of functional categories for the target language.

7.3.4 "Assets" of the Adult L2 Learners

Apart from the mature cognitive ability they have, adult L2 learners also have the advantage of knowing their native language accompanied with their wealth of rich experience. They can transfer most of their L1 knowledge to the target language. L1 language serves as a "crutch" in promoting their target language learning and communicating.

When they have very limited knowledge of the target language, L2 learners usually depend a great deal on their L1. Very often, they use their L1 language structure to communicate in the target language. We often hear them say: "When I speak English, I have the sentences in my mother tongue in mind first, and then I translate them into English". Thanks to the commonalities that all languages share, limited communication is intelligible with limited target language knowledge. Gradually, learners come to know the differences between their L1 and L2, and pay more attention to the specific rules of the target language, thus depending less and less on the "crutch" until finally they throw it away. By this time, they do not have to go through the stage of "translation" and they are able to think in the target language when they speak.

L2 learners' L1 has very often been thought of negatively and considered a main cause of the failure of adult L2 learning, although both "positive transfer" and "negative transfer" have been mentioned in the literature.

There is no doubt that linguistic theory has thrown light on L2 acquisition as much UG-based L2 research has appeared in the literature. Can linguistic theory and L2 research result contribute to L2 teaching, however? Consciousness-raising proposed by Rutherford (1988) and suggestions for teachers' training and curriculum development offered by Flynn (1990) demonstrates not only

the possibility but also the inevitable trend to link L2 acquisition research to L2 teaching. The discussion above is another attempt to combine L2 language research with L2 language teaching effectively. As in any other subject discipline, practice in the field often benefits from previously discovered knowledge about it. The same should be true for L2 teaching.

We should continue our efforts to further explore L2 acquisition and at the same time utilize research findings in L2 teaching and by so doing to stimulate and improve L2 teaching.

ENDNOTES

1. Lenneberg's assumption was questioned by Krashen (1973, 1975, 1981, cited by Stern,1983) because there is evidence that the cortical lateralization occurs before the age of five and that lateralization does not necessarily imply loss of any abilities (p.362).

2. This means that there is no Wh-word in the COMP position of the embedded clause. c.f. When did the boy say how he lost his key?

3. See p.29.

4. Here CP=S'', C'=S', and IP=S.

5. Huang was not sure whether a null subject in Chinese is a pro or a PRO and he suggested that Chinese need not be identified as a pro-drop language (1984).

6. Lasnik and Uriagereka (1988:95) propose:
a is "too far" from b iff b is contained in an S' that does not contain a.

7. Schachter accepts the assumption that topics in Chinese is derived through movement and Subjacency applies to topicalization structures.

8. See Glossary 23.

9. See Glossary 11, 13, and 14.

10. In statistics analysis, 'clearly grammatical' and 'probably grammatical' were combined into one category while 'clearly ungrammatical' and 'probably ungrammatical' were combined into another category.

11. The sentences in the table are numbered according to the numbers of these sentences in the Appendix I.

12. Only one sentence of each type is listed in the table. In the judgement task, each type has five or six sentences.

13. The samples of Chinese Group 1 and the control group are of very different size. Therefore, a correction in the value for degrees of freedom (Hays, 1981:287) was used and no effect was found on the conclusion.

14. It is not clear why the score of Wh-questions of the control sentences is low for both Chinese Group 1 and the control group.

15.In the judgment task, the Chinese Group 1 did much better on CNPC and SSC structure types than Wh-island and NP-island structures. However, At .05 level of significance, their score on CELT correlates with that on Wh-island and NP-island structures, which do not make any sense. Therefore, in this table .01 level is used.

16. In the present study, only Chinese Group 1 treated RC and NCC differently while Chinese Group 2 and the control group treated these two types indiscriminately. One explanation is that advanced L2 learners and native English speakers object any subjacency violation sentences.

17. Details see Celce-Murcia and Larsen-Freeman,1983:429.

18. In Martohardjono's study (1991), Both native English speakers and L2 group treat Strong Subjacency Violations (extraction out of a relative clause and an adjunct) and Weak Subjacency Violation (extraction out of a Wh-island and a Noun complement clause) differently. However, comparison between RCs and NCCs is not performed. The difference may be caused by the other two structure types.

19. See Spolsky (1989:7).

20. This data is from my seven-year-old boy in his written exercises.

APPENDICES

A. JUDGMENT TASK

Please circle one number to indicate your judgment of the grammaticality of the sentence (gram=grammatical; ungram=ungrammatica):

1. Do you remember who directed the best movie of 1960s?
2. What would for your daughter to give up be a pity?
4. What did he say how Mary was looking for yesterday?

5. What did your neighbor's dog eat a large strawberry?
6. Which movie have you forgetten the famous director of?
7. Who did Peter explain when Bill could come to help?
8. What does Tim wonder where Nancy put Saturday night?

9. Is it true that the earth is round as that teacher said?
10. Does Jim believe that story Mary told to her girl friends?
11. Who do stories about frighten Mary and her friends easily?
12. What did you think bill know Mary has bought since January?

13. What might your friend ask where I hid last month?
14. How many do you think John has invited of his friends?
15. What are pizzas with on top delicious in that store?
16. Did Fred know this morning that Alice left last night?

17. Did the girl with short hair hate her dress with pink dots?
18. Where does your boy friend that I have talked to come from?
19. What would for your friend to do annoy you in winter?
20. Where did Bill remember that John put his book last month?

21. Which movie did you guess that they had gone to last week?
22. Which book did Peter wonder whether Lisa had chosen?
23. What did the police arrest the man who were carrying?
24. What did the woman buy a hat that matches in our store?

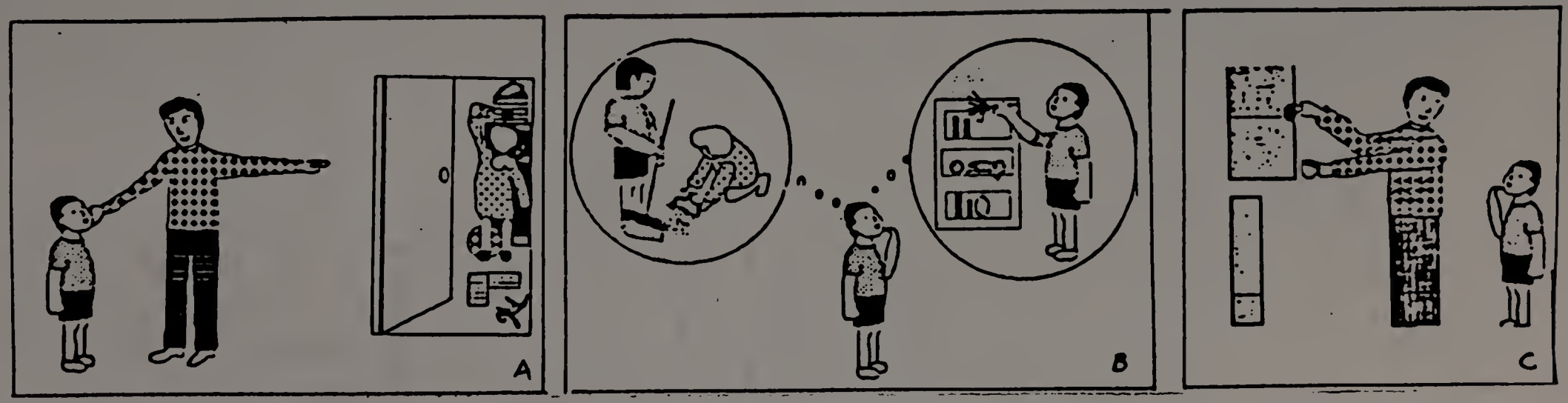
25. What can't you explain the fact that your son bought?
26. In which office did he say that Lisa works every afternoon?
27. Who are you currently reading a book that criticizes?
28. What does your interest in surprise your parents?

29. What did the girl of that house hate her dress with pink?
30. What does John believe the story that Mary saw last night?
31. What are you presently interested in his article on?
32. What does Mary want to know when John has already sold?

33. Did Jane need a cloth with red spots to cover up the mess?
34. Who does Mary play tennis with people who know very well?

Clearly gram	Probably gram	Probably ungram	Clearly ungram
1. 1	2	3	4
2. 1	2	3	4
3. 1	2	3	4
4. 1	2	3	4
5. 1	2	3	4
6. 1	2	3	4
7. 1	2	3	4
8. 1	2	3	4
9. 1	2	3	4
10. 1	2	3	4
11. 1	2	3	4
12 1	2	3	4
13. 1	2	3	4
14. 1	2	3	4
15. 1	2	3	4
16. 1	2	3	4
17. 1	2	3	4
18. 1	2	3	4
19. 1	2	3	4
20 1	2	3	4
21. 1	2	3	4
22. 1	2	3	4
23. 1	2	3	4
24. 1	2	3	4
25. 1	2	3	4
26. 1	2	3	4
27. 1	2	3	4
28. 1	2	3	4
29. 1	2	3	4
30. 1	2	3	4
31. 1	2	3	4
32. 1	2	3	4
33. 1	2	3	4
34. 1	2	3	4

B. READING COMPREHENSION TASK



1. The father told the little boy to help his sister clean up the play room.

The little boy didn't know if he should put away toys or sweep the floor with his sister.

So he asked his father how he should help his sister.

Who did the boy ask how to help?

Is there another answer? If yes, what is it?

2. The boy looked at his calender and found out that it was his grandmother's birthday.

He had forgotten to sent her a card. He decided to call her on the phone, but he didn't know how.

So he ran to ask his mother."Can you call Grandma with me? It's her birthday!"

Who did he ask to call?

Is there another answer? If yes, what is it?

3. The children were planning a surprise party for their favorite teacher. Every one was going to bring some food for the party.

But the boy didn't know what to bring. He asked the man at the grocery store, "What shall I bring my teacher?" The man told him his teacher loved apples.

So that's what he decided to bring her.

Who did the boy ask what to bring?

Is there another answer? If yes, what is it?

5. The girl was watching her mother do some woodworking. Her mother said. "Go and play. I'm too busy."

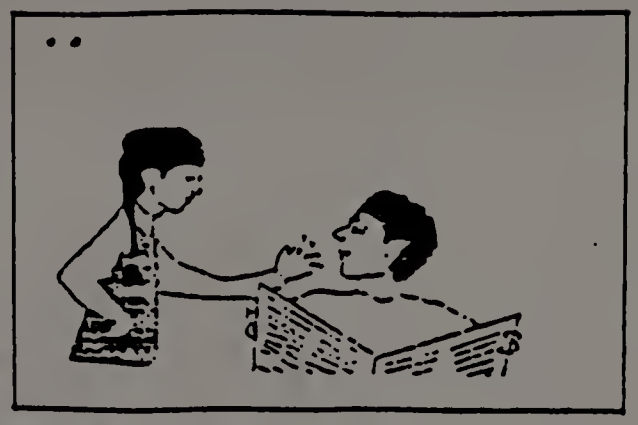
The mother was very pleased.

The little girl went to her brother for help. She said"Can I help my mother? I don't know what to do." Her brother said, "Take her this hammer, she really needs it."

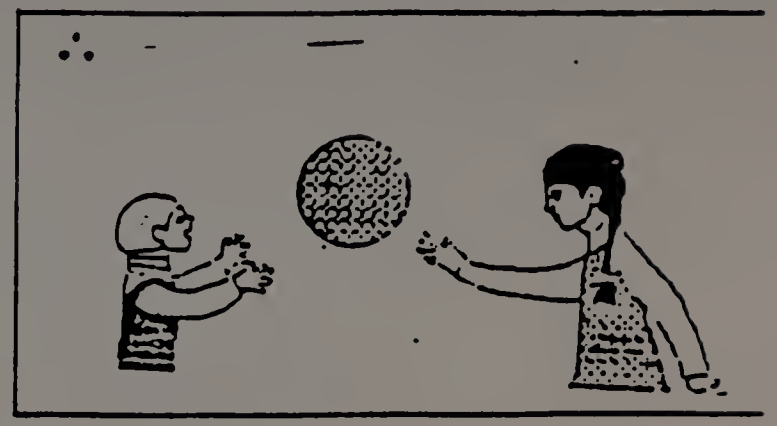
Who did the girl ask to help?

Is there another answer? If yes, what is it?

7. The little baby wanted the girl to play catch, but she didn't know what to throw him.



She went to her Daddy and said, "The baby wants me to play, but what can I throw him?" Her Daddy said,"Try the big ball".



So that's what she decided to throw.

Who did the girl ask what to throw?

Is there another answer? If yes, what is it?

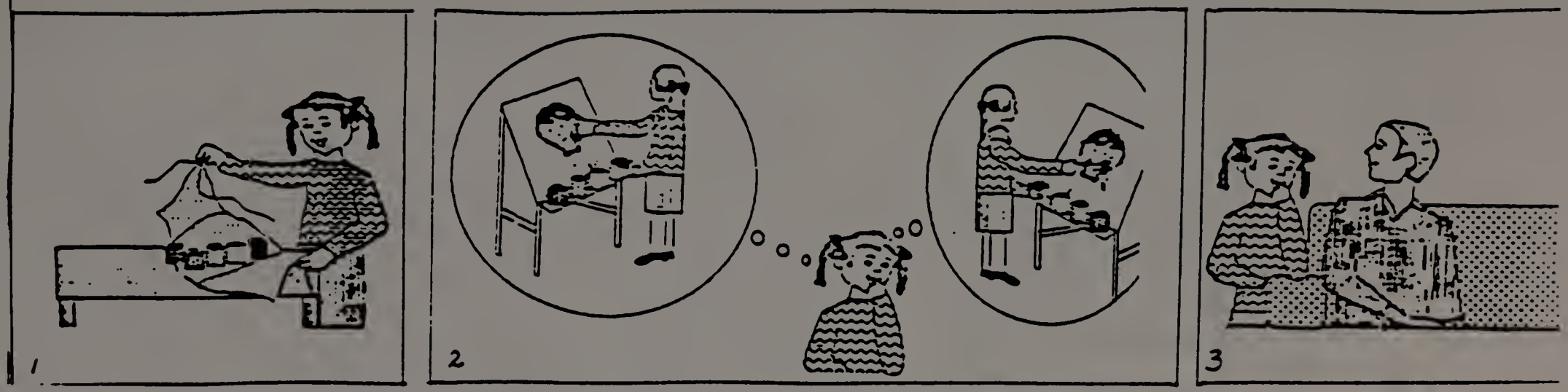
9. The boy loved climbing trees in the forest.

One afternoon he slipped and fell to the ground. He picked himself up and went home.

When he had a bath that night, he found a big bruise on his arm. He said to his dad,"I must have hurt my arm when I fell this afternoon."

When did the boy say he hurt himself?

Is there another answer? If yes, what is it?



10. A girl got some new paints for her birthday. She decided to paint a picture of her mother, but she didn't know how to use the paint. May be she could use a brush, or maybe just her finger? So she asked her father how to paint a picture of her mother.

Who did she ask how to paint?

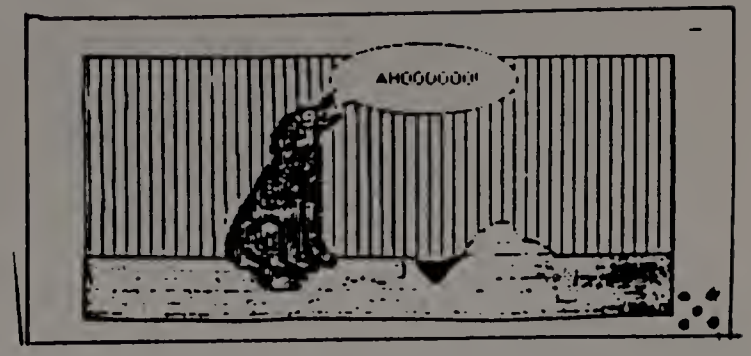
Is there another answer? If yes, what is it?

13. The dog got a very big meat bone from the garbage can.

He made sure no one was watching.

Then he buried it in the backyeard.

But late at night, the neighbor's cat sneaked in and dug it up, leaving a pile of dirt.

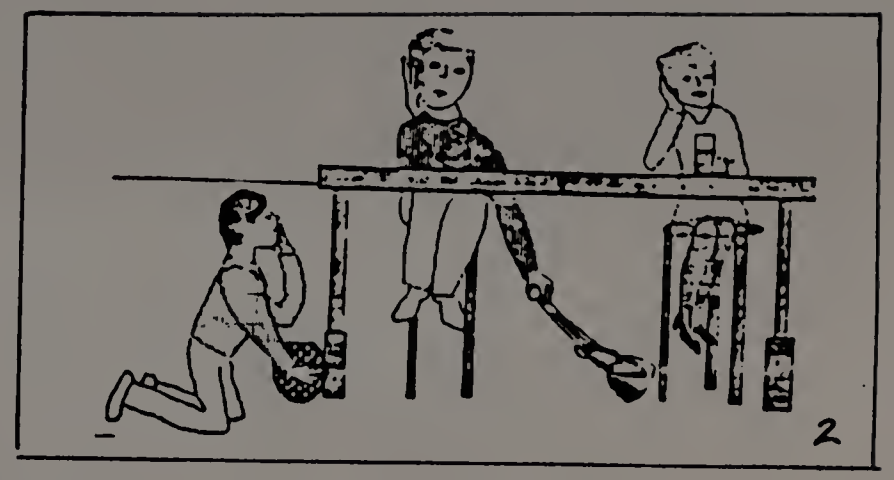


In the morning when the dog saw the dirt, he gave a big howl to tell everyone, "Someone stole my bone last night!"

When did the dog say how his bone was gone?

Is there another answer? If yes, what is it?

14. The policeman at the fair was watching out for robbers. A man with a pair of long tweezers walk by.



A little boy saw the man use the tweezers to steal a woman's purse.

He ran to tell the policeman. The man ran away.

But the policeman called over the loudspeaker, "Today that man stole a purse with his tweezers!"

How did the policeman say the man had stolen the purse?

Is there another answer? If yes, what is it?

17. Rover was a silly dog. His master took him to dog school to learn tricks.

The dog teacher said he must only catch toys, not children.

His master taught him to catch a frisbee by jumping in the air.

How did Rover learn what to catch?

Is there another answer? If yes, what is it?

18. One evening John found his bike had a broken wheel. He didn't know how he was going to fix it.

Luckily, late that night his friend Tom came over. Tom told him he should use a wrench to fix the bike.

But he said,"Wait until daytime so you can see."

When did John know how to fix his bike?

Is there another answer? If yes, what is it?

20. The mother didn't know how to bake a cake.

She watched a TV program about cooking.

She learned to make a lovely cake with chocolate pudding mix.

How did the mother learn what to bake?

Is there another answer? If yes, what is it?

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